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ILLUSTRATIONS.

Bedstone Court, Salop: The Residence of the Late Sir Henry W. Ripley, Bart.—Mr. Thomas Harris, Architect 824-825
Elevations and Plans of Sanitary Hospital for the Bournemouth District.—Mr. G. R. Andrews, Architect 828-829
Sculpture from Door of Narthex, La Madeleine, Vézelay.—Drawn by M. Adolphe Guillon 832, 833, 837
Meavy Church, Devon: Design for Reredos.—Mr. J. D. Sedding, Architect 836

CONTENTS.

Circular Hospital Wards 815
On Types of Beauty in Nature and in Art 816
Notes 817
British Association at Montreal 818
A Corner of Wiltshire 819
The "Caisse de Défense Mutuelle" in France 820
Semper's Theory of Architectural Ornament: Royal Institute of British Architects 821
Doorway of "La Madeleine," Vézelay, Yonne 822
Bedstone Court, Shropshire 839
Reredos, Meavy Church, Devon 839
British Museum Lectures 839
Taunton Castle 840
Architectural Societies 840
Royal Academy Students' *Soirée* 840
Competitions 840
Line of Frontage Case: Fulham District Board of Works *v.* Colls 840
By-laws under the Metropolitan Building Act: Building on Destruction of Welford-on-Avon Church by Fire 840
Disused Burial-grounds.—Blashill *v.* Chambers 841
Wide Tendering 841
Sculpture, Blackfriars Bridge 841
New Routes 841
Fire Bars 841
Water Storage 841
Provincial News 841
The Student's Column: A Second Perspective Lesson 841
Church-Building News 843
Recent Patents 843
Recent Sales of Property 843
Meetings 844
Miscellanea 844

Circular Hospital Wards.

ON Wednesday afternoon there was opened at Greenwich the Miller Memorial Hospital, founded as a practical memorial to the late Canon Miller, of Greenwich, who invented "Hospital Sunday." The hospital is a small one, and only one half of the ward portion of it is as yet built, but it acquires importance inasmuch as it is the first hospital with circular wards to be put into actual working. Its opening was followed, appropriately enough, by a meeting at the rooms of the Social Science Association on the evening of the same day to consider the subject of circular wards generally, when Professor Marshall, who first started the idea of the circular ward in this country, gave a short address, summing up, in an admirable and lucid manner, his views as to the superiority of the circular form and his reasons for them, and Mr. Keith Young, who, conjointly with Mr. Hall, was the architect of the Miller Memorial Hospital, read a short paper descriptive of the building and the objects which have been aimed at in its plan and construction.

The ultimate reception of the circular ward system will depend on the practical experience of the medical profession in regard to its working; but this seems a convenient moment for referring to and summarising the reasons for and against it, as well as alluding to one or two of the statements made at the small, but, as far as it went, very representative meeting at Adam-street, at which Dr. Buchanan presided.

Although Professor Marshall claims to have started the idea of the circular ward in England, his attention having been directed to it by considering the method of carrying out future extensions to University Hospital, the idea seems to have sprung up almost simultaneously in other quarters, and he found that the circular ward hospital at Antwerp (M. Baeckelmans and MM. Bellmeyer and Van Kiel, architects), of which mention has been made before in these columns,* had been designed as long ago as 1872, and that previously to that Sir Andrew Clarke, whose circular ward military hospital at Seaforth (not yet in working order) we illustrated a few weeks ago, had before that designed a circular ward hospital for Madras, which was not carried out, owing to objection mainly on the ground of costliness. Sir A. Clarke, speaking afterwards, carried the history of the matter a little further back. He disclaimed originality, and said that the idea had been first suggested to him in 1854 by Dr. M'Kenna, of Melbourne, a military doctor, who had found in the course of active service elsewhere that when the wounded were placed in convent rooms, hospital gangrene usually set in; when they were placed in a circular church, hospital gangrene seldom set in, and in a much milder form when it did. In 1858 Sir A. Clarke was reminded of this by the experience with the wounded at Rome in Garibaldi's campaign, when the Pantheon was made use of as a military hospital with the most favourable results; while, again, the convent rooms which were utilised as hospitals, turned out very unfavourably. We may just remark in regard to this piece of experience that too much stress cannot be laid on the operation of the circular and domed form of building unless we know also a little about the other constructive details of the buildings utilised, and the manner in which they are kept. The churches were very likely the cleaner places, and in most cases would be built of more favourable, because harder and more impervious, materials, besides the larger cubical space in proportion to floor area,—considerations which, of course, apply especially to the case of the Pantheon. This argument, therefore, must not be pushed too far.

The historical side of the subject was further brought out at the meeting we are referring to as follows. The Antwerp designs have been referred to. There is in a hospital at Bristol an octagonal ward, a form which, it may at once be said, combines nearly all the disadvantages of the circular form with some others peculiar to itself. Not long after the initiation of the circular idea in this country by Professor Marshall, an attempt was made to get it carried into practice at Spalding. Medical opinion was not adverse to it, but caution prevailed with the Committee. It was an untried experiment and a costly one, and they would not sanction it. At Burnley the authorities were less timid, and a hospital with circular wards of one story, but with a "sun-room" above, is in progress there, and is likely to be opened about October next. Then the necessity for adding an Infirmary ward to the Hampstead Workhouse, on a very irregular and confined site, led its architect, Mr. Charles Bell, to the idea of getting over the difficulty there by the circular form, and hence arose the three-storied circular building, not yet opened, which we illustrated in the *Builder* for Feb. 2 last. The Seaforth Barrack Hospital we have already referred to and illustrated (*Builder*, Nov. 15 last); this is also in progress, and Sir A. Clarke has plans in preparation for a somewhat similar one at Milltown, near Greenwich, and for a much larger one at Valetta: these two latter may be regarded as works to be carried out, as their form is decided on. We have thus at the present moment one circular ward hospital actually opened, and five which may be regarded as practical schemes to be completed before long, viz., Antwerp, Burnley, Seaforth, Milltown, and Valetta; so that the circular ward system is now getting fairly past its theoretical stage.

Let us now consider the arguments for and against, as they appear at the present moment aud in the absence still of the only sure test, that of experience. The arguments for the circular form in itself, irrespective of the nature of the site (which, as we shall see, is really a most important factor in the matter), Professor Marshall puts thus:—A circular ward gives a larger floor area per run of wall than a rectangular one, consequently also a larger cubical content. The action of the wind against the exterior surface, in the matter of affecting temperature and producing draughts, is much less powerful and direct than against a straight wall; whatever the direction of the wind, it can only operate fully against a small portion of the building, and is carried round in a circular current over all the rest of the surface. When the state of the weather is such that opening the windows is possible and desirable, the advantage is felt internally in the escaping of direct draught and the promotion of a gentle circular current round the room; whatever current of air strikes the wall having a tendency to continue round its inner circumference. The avoidance of all angles in the walls is an obvious advantage, it being now a recognised principle in hospital building to avoid angles of every kind that can hold dirt and render cleaning difficult. The advantage becomes greater and more marked when any angle at the junction of walls and roof is also avoided, and the ceiling is carried up in a more or less domical shape as a continuation of the wall. As Professor Marshall states it, fouled air has a tendency to mount up along the domical ceiling towards the centre, as certainly as water has a tendency to run *down* towards the centre of a dish with a bottom sloping to the centre. This is put a little too strongly; there are so many influences affecting currents of air which do not affect the action of water by simple gravitation; or, to put it more correctly, the superior lightness of the fouled air, which leads to its upward gravitation, is not nearly so marked as the superior weight (in comparison with surrounding air) of the water, which leads to its downward gravitation. Theoretically, however, no doubt the conclu-

* For plan see *Builder*, July 7, 1883.

sion is correct, and part of the advantage of the circular ward is lost whenever the ceiling is made flat.

These are the advantages supposed to be inherent in the circular ward *per se*. But practically the most important and undeniable one so far is in its special adaptation to the difficulties of special sites, which has mainly led to its adoption in the Hampstead and the Greenwich cases. In regard to this, we cannot do better than put the matter in the words of Mr. Keith Young's paper on the Miller Hospital, which followed Professor Marshall's address. He said :—

"The site occupied by the buildings already erected, consists of a rectangular piece of ground immediately in rear of the Royal Kent Dispensary ; in length about 63 ft., in width 46 ft., or about 2,898 square feet in area. On the north it adjoins the dispensary building just mentioned ; on the east a large garden or yard, belonging to a chapel ; on the west a blind road or *cul-de-sac*, by which access is obtained to the hospital ; and on the south the ground on which the future extension is to be built. It is not, I think, very difficult to see that to plan a hospital at all on a site so restricted as the one before us is by no means an easy task ; the position of the dispensary, and the fact of its having windows overlooking the hospital site, whose light must not be unduly impeded, present obstacles of a very serious nature to the efficient lighting and ventilation of the wards. Careful study led us to the conclusion that wards of the ordinary rectangular form were entirely impracticable, and that the only possible way of overcoming the difficulties of site, was to adopt the circular form for our wards. To illustrate my meaning more clearly, let us suppose the circular ward nearest the dispensary to be removed, and to be replaced by a rectangular ward for the same number of beds, and the same floor area per bed ; the result of this would be, that when the ward was placed in position, its north wall would fit close up against the back wall of the dispensary. I should mention that, in view of the intended future extension southwards, the position of the administrative building is necessarily that which it now occupies."

To these advantages we will add one other of a distinctly architectural kind, namely, that the circular form gives an architect better chances of imparting a certain degree of picturesque effect to a hospital, as was evident in some of the drawings that were exhibited of hospitals that have not been carried out. This is a consideration which can only be advanced after it has been satisfactorily shown that the practical advantages of the form are paramount ; but, that granted, it counts for something additional in its favour.

The disadvantages of the circular form, as admitted by its supporters are, first, increased cost. One or two supporters of the system deny this, but, of course, no practical architect will question it for a moment. It means increased cost in walls, floors, and roofing ; and the superior cost of the two latter elements increases in ratio as the size of the ward increases. There is a wide area to cover instead of a comparatively narrow apartment. The second is that, although the area per run of wall is slightly greater, the actual amount of ground on the site is not utilised to the same extent as with rectangular buildings ; considerable areas outside the circle are lost. When, as in the case of the Miller and Hampstead Hospital, the filling-up of this area would have brought the Hospital too close up to adjoining buildings, this cannot be considered a loss, so that this is obviously a question depending upon the special character of the site. An objection maintained by medical opponents is that the windows opposite the bed where an operation or dressing has to be performed or a minute examination made, are too far off to give sufficient direct light. This Professor Marshall denies, and states that the diffused light obtained from all sides is equal, if not superior to, that derived from the single near window opposite to the bed in an ordinary rectangular ward. This is a point on which only practical surgeons can speak, and architects must in such a matter bow to their decision. We may reasonably suppose that the opinion of Professor Marshall would be a little biased in favour of his form of ward, and that it is only wise to wait for further surgical evidence on this point before feeling satisfied about it. The further disadvantages incident to the circular form which occur to us are, that each patient has a fuller view of all the others than in any other form of ward, and this is a condition to be avoided as far as possible ; that the plan necessitates, almost, a large central block or column for fireplaces and ventilation, and this is in the way of complete surveillance of all the beds by the principal nurse ; and that the arrangement brings the feet of the beds inconveniently near to each other, except in a ward of larger radius than on other accounts it would be desirable or even possible to adopt. The full advantages of the plan in regard to warming and ventilation can only be realised with the central arrangement referred to, and we doubt if this central mass blocking the middle of the floor can ever be felt to be otherwise than an inconvenience : though we do not suggest this as a very serious drawback. Still, we hold that the rectangular ward will be found the most convenient for inspection and administration ; and although Sir A. Clarke said that when inquiring where any hospital disorder had first broken out he had always found it was at the beds in the angles, "where there was no ventilation," it may be replied that it is surely possible to build a rectangular ward so that ventilation should be complete in the angles.*

It appears to us, therefore, that the absolute superiority of the circular ward is at present established only in regard to sites where a rectangular form would bring the ward too closely into contiguity with adjacent buildings, and leave insufficient space for light and external circulation of air. In regard to the latter object, the circular ward in situations confined by buildings, no doubt, offers special advantages which no other form can equal. In other points and apart from site, although we are disposed to feel much less doubtful about the circular ward than formerly, it appears to us that advantages and disadvantages are, so far, about balanced, and that there is not yet ground for adopting the circular ward as the ward of the future. It must be compared with the rectangular ward on the best construction and with the best appliances, not with wards built merely on what are sometimes called "common-sense" principles ; a vague phrase, which often means avoiding the trouble and difficulty of investigating details. "Common-sense" on such a matter consists in studying the question in all its details, in the light, first of theory and then of experience, and adopting the form which best stands the test of investigation.

In regard to some practical details, Mr. Keith Young considers the diameter of 35 ft., that of the Miller wards, the smallest that can be adopted without giving a feeling of confinement in regard to the central floor space (besides, we may add, bringing the feet of the beds too close,—for it must be remembered that the size of bed is a "constant"), and Sir A. Clarke regards 60 ft. diameter as the largest desirable. This is also probably correct : a larger size would lead to waste of floor space. In the Miller wards, of 35 ft. diameter, there are ten beds, giving a wall space of about 10 ft. per bed, which is liberal. In the Hampstead ward there are twenty-four beds, giving 6 ft. per bed, which is certainly the very least there ought to be. It is noteworthy, however, that although the wall space to be allowed at Hampstead is so much less, the cubical contents still leaves 1,000 cubic feet of air per bed, as against 1,100 cubic feet in the Miller ward. In other words, as the circular ward increases in size the wall space can be more closely occupied. In a ward of smaller size, the radiating position of the beds would also inevitably prevent their being put much closer than a 10-ft. spacing.

It was mentioned incidentally at the meeting that the Miller Hospital would probably be used in part at least as a hospital for paying-patients, and that curtains were arranged between the beds their full length ; and another speaker suggested that curtains coming forward 4 ft. from the wall would secure sufficient privacy. Now, it is just in this form of ward that they would *not*. In a rectangular ward, with the beds in a line, short curtains would secure privacy in regard to all except the opposite occupants ; in a circular ward they would not. But is it not a serious question whether this array of curtains would not do away with some of the very advantages claimed for the circular ward, by checking ventilation and holding effluvia ? This is more a doctor's than an architect's question ; but so it appears to us. The proper sort of screen would appear to us to be one of some such material as thin enamelled iron, hung on a rail so as to leave about 3 in. between it and the wall, and not interrupt ventilation ; and to be removable and washable. Bedclothes there must be ; but surely it is not desirable to increase hanging stuffs in a hospital ward more than can possibly be helped.

* The actual "angles" should, of course, be rounded off.

Towards the close of the meeting we have been referring to, Professor Marshall received and read an interesting letter from Lady Strangford, accompanied by a plan of a hospital with circular wards which she had designed to be carried out in Egypt, with circular domed wards with top light and ventilation, a manner of building in keeping with the habits of the country in domestic architecture. Lady Strangford added that in her hospital at Cairo, where there was an inner domed room, the patients were found to do better than in any other ward. This was certainly an interesting and opportune testimony in favour of Sir A. Clarke's view as to the domed form. These wards, it must be observed, have the central floor-space unencumbered in any way.

ON TYPES OF BEAUTY IN NATURE AND IN ART.

In a previous article * some progress was made in setting forth the analogies between structure and function in the organisms of nature and in works of art. The subject admits of further and extensive development, and is already in the way to be greatly assisted by what is becoming the important study of anthropometry. The subsidiary science is of too recent an origin to have realised all its capabilities, but zeal and sagacity seem not likely to be wanting to make the most of them.

Anthropometry has for its object the investigation, record, and study of the measurements of the human body in respect of its dimensions, weight, and the strength of its various physical powers. It is thus ancillary to anthropology, the natural history of man, so far as this science is concerned with man's physical development. Now, the assistance which the anthropometrist may be called on to supply falls generally under several heads. In the first place, he has to undertake the functions which are akin to those of the pure statistician. To him we must look for accurately compiled accounts of the physical conditions of the population in respect of growth and force, as it is distributed in districts, or in diversity of occupations, or at different ages. The value of the knowledge which is so obtained has appeared in the observation that a serious fallacy lies in making one standard height the test of suitableness for military service for Englishman, Welshman, Scot, and Irishman. It is manifest also that conclusions can scarcely but be brought out which will have important bearing on the conditions of health and vigour. A very considerable mass of statistics has already been accumulated and cannot be glanced over,—as in the "Manual of Anthropometry," by Dr. Charles Roberts, and the report of the committee,—without suggesting a variety of lines of study and comparison. We must look, however, to the anthropometrists themselves for reaping the full harvest of knowledge from their laborious preparation of this scientific ground. What we are concerned at present to indicate is that their ground admits of extension, and in a direction as interesting to art as it is to science.

What interests artists in anthropometry is not the general average of human forms, or

* See p. 581, *ante*.

even of special classes, but the most perfectly characteristic type of such classes, which will never be brought out as the result of an average. It is in this respect that the observations of Sir Joshua Reynolds have proved, perhaps in consequence of his qualifications not being duly allowed for, somewhat misleading. "From reiterated experience," he says, "and a close comparison of the objects of nature, the artist becomes possessed of a central form from which every deviation is deformity." Accordingly, Dr. Roberts pursues, "The distinguished mathematician, Quetelet, like the artist and the physiologist, recognises the existence of a central or typical form in man; but while theirs are ideal forms, his is a real one, and is the *mean* result of a large number of actual measurements of the living body. Hence the 'central form' of Sir Joshua Reynolds and the 'canon' of typical proportion of Professor Carns become the 'mean man' (*homme moyen*) of M. Quetelet." It is true, no doubt, that all men have been, to a certain extent, cast in the same mould, and so far the race admits of a type or model having certain universal characteristics and proportions. This general type, however, can be little more than a diagram or a formula, valuable for certain applications, but utterly characterless in any artistic sense,—as little to be taken as "a central form from which every deviation is deformity" as the archetype vertebral skeleton defined by Professor Owen. Sir Joshua, to do him justice, no sooner has uttered his dictum about the central form than he is struck by its difficulties and proceeds to make admissions rather than qualifications which are, in truth, equivalent to withdrawal in favour of a more defensible scheme. "To the principle I have laid down, that the idea of beauty in each species of being is an invariable one, it may be objected that in every particular species there are various central forms which are separate and distinct from each other, and yet are undoubtedly beautiful; that in the human figure, for instance, the beauty of the Hercules is one, of the gladiator another, of Apollo another, which makes so many ideas of beauty. It is true, indeed, that these figures are each perfect in their kind; but still none of them is the representation of an individual, but of a class."

But here again we find the great president going astray; the statues referred to are as absolutely individual as figures can be. Hercules is as absolutely Hercules as the president's own portrait of Lord Heathfield is Lord Heathfield, and the Apollo is as exclusively Apollo as his Dr. Johnson is Dr. Johnson. A figure is a type of its class in two senses,—first, as having all the characteristics which are present in every member of the class and none other; to decide this type it is necessary to exclude all details not common to all examples, otherwise any individual might be taken as a type; guidance, therefore, must be obtained by a comparison of large numbers. Such comparisons have this advantage, that they bring into view the points in which the largest numbers of agreements occur.

But the type of a class in the most important and valuable sense is an example in which the special characteristics are combined in the greatest perfection; if we are to gain a conception of this we must apply ourselves to study what those characteristics are and their relative value, and then to search for the exceptional individuals which exhibit them in the most admirable development; practically it may be safely said they are never to be found in nature assembled in a single individual, and thus it is that when associated and fused by fancy the type of a class is appropriately called ideal.

Naturalists have accepted this rule,—that the type of each genus should be that species in which the characters of its group are best represented and combined in happiest proportions. In the case of a national type this is the proportion which gives most efficiency to an organisation which is limited by certain permanent conditions, and especially by whichever is most important.

When this type is ascertained, it is for the anthropologist to press to the utmost his investigation of the factors which determined the model. Climate, elevation, as flat or mountainous, hot or cold, wet or dry; prevalent food and drink, occupation, and so forth, are taken into consideration, and still leave a remainder to be assigned to race,—to primeval influences affecting race,—and to the generally unknown.

The character of a perfect type is perfect suitability of a complex assemblage of organs to the requirements of functions which have reference to an end or general purpose of some certain complexity and dignity. Every natural organism, plant, or animal in the wild state conforms to a certain type which is in some degree explainable by the conditions of its sustenance and growth, preservation and propagation. And physiologists have much more to do before they will be able to explain how the original adjustment of the organism and instincts to surroundings first came about.

But beyond this original adjustment a species is found to be susceptible more or less of alteration, to be plastic, and to develope into modifications of type which are again very specially defined. Cultivation will take such effect upon a flower as to evolve most extraordinary varieties of beauty. Again, the marvellous variety of highly characteristic types of the dog must spring from a natural plasticity, and, more than that, from plasticity having a special bias in certain directions. The natural instincts of the animal respond to characteristics of environment in the differences of prey to be pursued, or fought with, as absolutely as its coat is suitable to exposure in weather, and its digestive organs to the food which its teeth are suited to grasp and to masticate.

In the same way every characteristic type of man is the expression of response to characteristically defined influences and exigencies. The anthropometrist may be not unworthily occupied in determining what is the true type of a perfect equestrian. It would certainly be something very different from the type of a sailor, or a navvy, or a coachman.

What perfection of type is in nature perfection of style is in art, and much the same principles are involved in appreciating the characteristic types of style as of organism in the animal or vegetable kingdoms. If we compare the average of the proportions of Ionic columns with the average of Doric we shall, no doubt, obtain a result which exhibits very decidedly the main contrast of the two styles to this extent,—and so far we should be directed, if the matter were not self-evident already, to a point of difference in the two styles which is of vital importance. But our average column would only by accident coincide with an example of peculiar excellence, and so far must be less instructive than the individual extreme examples from which the average was obtained. The mean between two admirable examples may be as unsatisfactory as between two that are admirable in no respect. Whether we take a general average, or an average corrected by exclusion of extreme or insignificant groups, the *mean* of Quetelet and Dr. Charles Roberts, we, in either case, obtain a somewhat bald abstraction, as none of the details that give special interest to individual examples are represented in the result.

A mischief of an opposite nature is incurred when the value of subordinate types is as much neglected as the general type, and composition in a certain style is indiscriminate in its adoption of whatever details occur in any of its examples. Special character is not only distinctive of a style at large, but is demanded for every several variety of the style,—nay even, in due subordination, for every specimen of a variety which shall claim to be a work of original art.

The thoughts of an architect are familiarly conversant with a great variety of types of structures, from a palace to a shooting-box, from a metropolitan hospital or a theatre to a country-house or a Wesleyan chapel. They dwell in his mind as disembodied shapes, ever ready to assume varied proportions, dimensions, adjuncts, even in conception, but only to be fixed as definite designs upon presentation of local and all other definite conditions. An executed work, so far as it fully and worthily satisfies such conditions, conditions which include a requirement for characteristic beauty as well as serviceableness, is then a type, and may take its place at the head of a class including numbers, every one of which shall make clear admission of affinity, though not abrogating subordinate characteristics purely its own.

It is perhaps in sculpture, which strangely enough exceeds other arts in the proportion of its failures, that, thanks to the genius of the Greeks, we find not a few examples of success which have every claim to the high distinction of characteristic types. In painting, again, the works are numerous, of which we may truly say that they represent their classes with all the perfection of which they are severally capable. How far can the same be said of architecture, and what is the explanation if we cannot speak quite so confidently? Architecture would not be the source of delight that it is, both in study and contemplation, if numerous structures did not at once start up in memory to answer to the challenge. But let us be cool, and let us, above all, be fair. In demanding an example which is entitled to the honours of a perfect type of its class, we must bethink ourselves, before awarding such honours, as to what is meant by perfection. We pass rapidly in review before the mind a series of renowned and admirable buildings with which we are familiar as existing in full or not seriously impaired preservation, works of our own time, and works of predecessors; but of which, or let us say of how many, are we prepared to say that they give us perfect satisfaction,—that in them a given style, or a truly worthy ideal, is carried to the ultimate development in all parts and consistently,—that we wish in them nothing to be otherwise than as it is, and miss nothing which would give an enhanced charm, or that we are not left with an uneasy sense of defect or deficiency of some sort, we know not what?

If this is the case, notwithstanding the labour and the genius of which these works are the monuments, it may be taken as a warning to the world how difficult are the problems for the combination of beauty and dignity with serviceableness that it requires its architects to solve; and the thought is not altogether discouraging for architects, as it implies that,

"Much has been done, but more remains to do."

NOTES.

THE conclusions to which the Royal Commission on Metropolitan Sewage have come in their final Report, whatever may ultimately be thought of their practicability, are in strict logical accordance with the main tendency of the evidence so far as it is summarised in the Report. The conclusion seems inevitable that, however sewage may be usefully and remuneratively employed by irrigation on a smaller scale, and under favourable circumstances of site, the London sewage is a special problem; it reaches to so huge an amount, and would require such an extent of land for utilising it, and such immense machinery for carriage and distribution, that the problem must be regarded as one that cannot be met in this way. The conclusion of the Commission is in favour of chemical precipitation of the solids, the solid matter "to be applied to raising low-lying lands, or burned, or dug into the ground, or carried out to sea," the liquid portion, *as a preliminary and temporary measure* (words in italics in the Report), to be allowed to escape into the river, but with the ultimate intention of treating this by intermittent filtration, which requires a much less area of land than broad irrigation. The Commissioners set their face against permanently sending even the effluent into the river without filtration through land. The great advantage put forth by the Commissioners for this system is that the most important part of it, the precipitation, can be applied without delay and in contiguity to the present outfalls. There is a gleam of hope in this, at

all events. Some of the suggestions of important witnesses may be considered when the evidence is published in detail. The Report as it stands is a very long, and, we may add, a very interesting one, worth the careful perusal of all concerned in the subject.

THE question of the construction of an underground railway from the Marble Arch to Cornhill is one that should be decided by one tribunal alone,—the deliberate choice of the metropolis. To remit the decision of so grave a problem to the toss-up of a couple of Parliamentary committees would, as in the case of the Manchester Ship Canal, be little less than a public scandal. Such a project may either be a well-digested effort to supply a public want, or a predatory attempt to filch the traffic of an existing line, at the cost of the residents along the suggested route. London, and London alone, has the right to decide which it is. But one or two considerations occur at this stage of the ventilation of the project. The first is that the first need for additional railway communication through London is from north to south, from Charing Cross to Euston or St. Pancras. This line should take precedence of a third route,—or indeed, a fifth route,—from east to west. The second point is, that as electric traction is proposed, it would be well to delay the authorisation of a new sub-metropolitan railway until electric traction has become practically established. And, thirdly, we have to suggest that in the case of any new line through London we should borrow a hint from the engineers of Paris, and pierce the tunnel at so low a level as to avoid all interference with drainage, gas and water mains, and foundations; so low, in fact, that with an improved traction system the line should not be a destructive nuisance to the householders whom it undermines. And if the public will not descend, by lift or otherwise, to this requisite level, they can be in no crying need of the line. Had we not better set our streets in order first?

THE long-delayed improvement at the corner of the Poultry and Princes-street will shortly be completed, the lease of the European Tavern, which occupies a portion of the site, having recently expired. The old materials of the public-house and a portion of Bank Buildings adjoining, recently occupied by the Azienda Assurance, have been sold by auction, and the premises will shortly be pulled down. The estimated cost of the improvement, exclusive of professional services, is 21,600*l.*, which is at the rate of nearly 50*l.* per foot superficial.

AN interesting "find" has been made at Purwell Mills, near Hitchin, on the property of Mr. Charles Willes Wilshire. Roman bricks, shards of Samian ware, and coins of the lower empire having frequently been found in this neighbourhood, it was determined during the last month to excavate in a field near the Mills. The examination has brought to light the foundations of a Roman building; several rooms have already been unearthed; in one is the remnant of a rough tesselated pavement, red, relieved with a white pattern; in another the usual hypocaust, or apparatus for heating the house by hot air; some coins of Constantinus Secundus (eldest son of Constantine the Great) and Magnentius, have been found, which are presumptive evidence that the house was inhabited about the middle of the fourth century; a great deal of broken pottery, both fine and coarse grained, has turned up; also fragments of some glass vessel. The tiles from the roof lie in position as they dropped when the wooden superstructure gave way. The foundations are built of roughly squared flint blocks, set in excellent mortar. In breaking a detached piece, the stone was found to give way before the cement. It is premature to form any conclusions as to the size of the building until further examination has been made, but from the small dimensions of the rooms, the rough nature of the pavement and the pottery, some of the explorers are disposed to think that here we have the remains of a Roman middle-class house, rather than those of some great man's villa, like that discovered at Brading. Should future examination confirm this view, it will add considerably to the interest of the discovery. We understand that the excavations are to be carried on until the whole ground-plan is laid bare. Considerable interest is taken in the work, and a great number of folks have visited Purwell Mills during the last fortnight.

WE are informed that the plot of ground at the commencement of the proposed new street from Piccadilly-circus to New Oxford-street, which forms a portion of the improvement authorised by the Metropolitan Streets Improvement Act, 1877, upon which the London Pavilion Music Hall is intended to be rebuilt, will have frontages upon what is now called Tichborne-street and Great Windmill-street, and the ground-floor will be utilised for shops where the land abuts upon those streets. The total area of the ground is 12,000 ft., and the rent to be paid is 3,000*l.* per annum, which is equivalent to 5s. a foot for the whole area. The lessee is to have the option of purchasing the ground-rent at twenty-seven years' purchase, which makes the value of the land in fee simple 394,036*l.* The lessee agrees to expend a sum of not less than 40,000*l.* in rebuilding the premises, and to pay the Metropolitan Board, who are the proprietors of the present Music Hall, 15,000*l.* on the transfer of the licence to him. The Metropolitan Board acquired the Pavilion Music Hall some years ago under an award by Sir Henry Arthur Hunt, who fixed the sum to be paid by the Board in compensation at 109,000*l.* The hall is at present let to Mr. E. Villiers at a rental of 7,000*l.*

WE cannot doubt that the explosion of the 13th December was a serious attempt at the destruction of one of the noblest monuments of London. The distance at which the explosion was heard, if compared with that at which such a noise as that made by the blowing up of a powder-mill, or the discharge of very heavy artillery, is audible, is enough to show that the charge of the deadly fulminant employed was enough, if directed with precision, to have blown out an arch, to say the least of it, of the bridge. But fortunately for civilisation, the precision of place and of time, without which the more rapidly exploding destructive preparations are really less dangerous than a more slowly expanding powder, are almost impossible to those who seek to perpetrate such outrages. From the latest reports, however, it would seem that the bridge has been in more danger than was at first supposed, and that every attempt had been made to plant whatever explosive force was used in a peculiarly effective manner at the base of the pier, and not above water.

THE Institute of France, on the 13th, nominated M. Diet as member of the Section of Architecture, to fill the place left vacant by the late M. Abadie. M. Diet is a former holder of the "Grand Prix de Rome," Honorary Architect and Member of the Council of Architecture of the city of Paris, Inspector-general of the Conseil des Bâtiments civils, and was the architect of the new Hôtel Dieu and of the buildings for the Prefecture of Police, on the Quay, at Paris. M. Diet also completed the "Musée Napoléon" at Amiens, and carried out the enlargemant of the Maison de Santé at Charenton, and other works of importance.

FROM *La Nature* we learn that, though electric lighting is carried out in several ways in private dwellings, it is always rather costly. One of the best systems is that of Gaston Menier, in which 150 Swan lamps are used of 40 volts and 0·7 ampères, supplied by a series of 22 accumulators. These nominally yield from 40 to 50 ampères, which are sufficient to supply 60 lamps at a time, a number more than sufficient for any ordinary purpose. The accumulators are charged each day by a continuous-current Gramme machine, excited in derivation, which is regulated by resistances introduced into the circuit. The machine is driven by a 5-h.p. "Otto" gas-motor. With a little practice, the servant who has charge of the lighting can estimate the consumption pretty accurately, and re-charge the accumulators, allowing an excess of 10 or 12 per cent. for loss,—possible errors. When it is necessary to use all the lamps, the direct supply from the machine is added to that of the accumulators.

IN a recent number of the *Bulletin Technologique* is described a new ceramic product from the waste sands of glass-factories, which often accumulate in immense quantities, so as to be an occasion of considerable embarrassment. The sand is subjected to immense hydraulic pressure, and then baked in furnaces at a high temperature, so as to produce blocks of various dimensions and of a uniform white colour, composed of almost pure silex. The bricks, when plunged into chlorohydric or sulphuric acid, show no trace of alteration, have remarkable tenacity and solidity, and are not affected by the heaviest frosts or the action of sun and rain. They have strong resisting powers to high temperatures, provided no fluid is present, and are also very light, the specific gravity being only 1·5. The pure white colour allows of many architectural effects in combination with bricks and stones of other colours.

WE have received the second annual report of the Metropolitan Public Garden, Boulevard, and Playground Association, for the year 1884. Under the head of "Successful Work" the Association shows a fair amount of achievement in what must be at present a very up-hill labour, and the list of propositions attempted, under the head of "Unsuccessful Work" shows that the Association keeps itself on the alert for all reasonable opportunities of putting its views into practice. As its objects become better understood the Association will, no doubt, find the items under the head "Successful" increasing, and those under "Unsuccessful" diminishing.

THE decision in the case of "Blashill *v.* Chambers," which we report elsewhere, is certainly one more in accordance with legal than with surveying and sanitarian interpretations. It appears from this that the presence on a building site of coffins filled with the remains of dead bodies does not constitute "material impregnated with animal matter"; and that the defendant, having put a shield of 18 in. of concrete over this conglomeration, had done his duty according to the letter of the law. In that case, the letter of the law had better be modified. We do not say that 18 in. of concrete is not a sufficient sanitary defence as long as the concrete remains solid and impervious; but it may be a considerable question how far the concrete is liable to crack from partial displacement when put on such an insecure style of foundation; and in that case the inhabitants would have to face the chance of mechanical and sanitary injury to their habitations at the same time.

British Association.—At the close of the British Association meeting at Montreal, the suggestion was brought forward that, in commemoration of the meeting, and as a recognition of the hospitality with which the members of the Association had been treated in Canada, it would be a graceful act to form a fund for the purpose of founding a gold medal at the McGill University at Montreal. After consultation with the authorities of the University, it was agreed that, subject to further consideration, the medal should be given annually, in the Faculty of Applied Science, in which there is at present no prize of this sort. Lord Rayleigh, the president of the Association, undertook to act as treasurer, and Mr. W. Topley and Mr. H. Trueman Wood as hon. secretaries. In answer to an appeal circulated amongst the members in Canada, and to a circular which has been issued in this country since the return of the Association, a sum amounting at present to 54*l.* has been subscribed. Deducting the necessary expenses of printing and postage, there will remain an amount of something over 500*l.* to provide the medal.

A CORNER OF WILTSHIRE.

QUITE close to the western boundary of Wiltshire, and about half way from north to south, lies the little town of Bradford-on-Avon. The river from which it takes its name rises in the northern part of the county, and, after flowing beneath Malmesbury Abbey, and through Chippenham, finds its way among pleasant pastures to the factory chimneys and deep-dyed contributions of Bradford: thence it passes by way of Bath to the great town of Bristol, and, creeping at a dizzy distance beneath Clifton Suspension Bridge, it finally loses itself in the Severn River. At Bradford it flows at the foot of a considerable hill, upon which the little town has perched itself, terrace upon terrace; while the banks of the stream are, for the most part, occupied by cloth-mills, which avail themselves of its help, and, in return, deliver into it most of what they do not want themselves. The mills, however, are not offensively obtrusive. Their presence serves to give a feeling of life and animation to the scene, without entirely monopolising both bank of the river to the exclusion of the seeker after the picturesque. Away from the water their influence is hardly perceptible, and one may toil up the steep streets, or climb the winding flights of steps which insinuate themselves between the houses, without being in the least reminded of anything so prosaic as cloth-making.

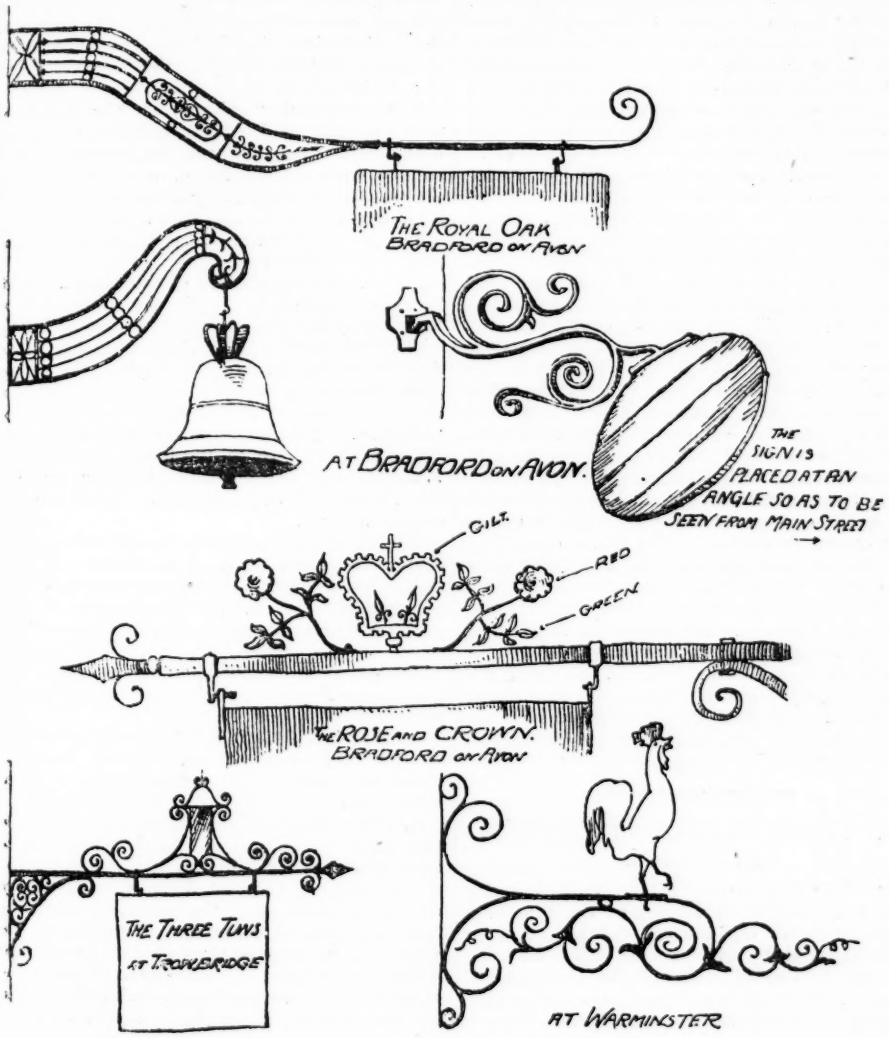


Fig. 1.

Fig. 2.

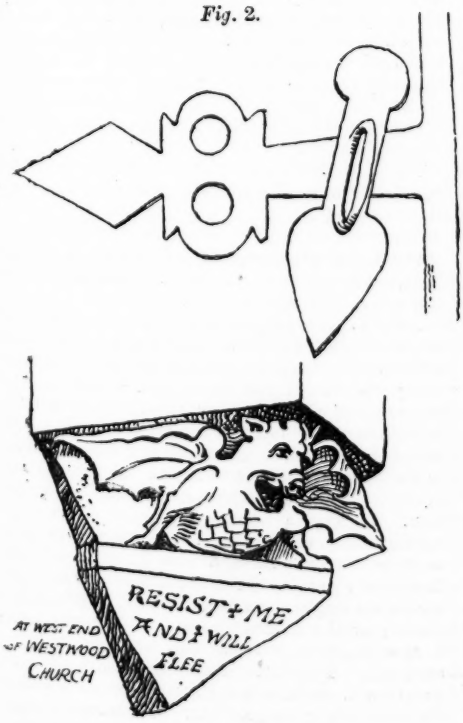


Fig. 5.

Fig. 3.

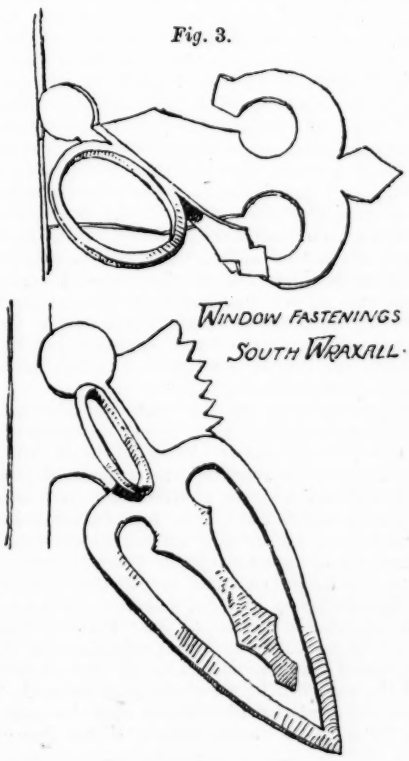


Fig. 4.

The centre of Bradford is its bridge. Here the road is tolerably level; here, if anywhere, there will be some life to be seen; the broad and shallow stream gives a feeling of space which is vainly sought for in the narrow streets; while the parapets being, as John Thorpe remarks of certain walls on one of his plans, "coped leaning-height," afford comfortable quarters to all who are fond of a good gossip indulged in to the soothing murmur of the water, and under the continual expectation of meeting one's friends. But it is not only for the unemployed, contemplative natives that the bridge has attractions. It has the great merit of being picturesque when seen from below, and of possessing, above, an unusual feature demanding attention from every stranger who merely crosses. This is a great point in a bridge. A bridge is usually a modest beauty whose charms only become apparent when sought for, and which are often unrecognised by ordinary acquaintance. But Bradford Bridge has a beauty-mark in the shape of a small building resting on one of the piers. Curiosity is naturally excited as to how this building is supported, and in settling the point, the whole series of Leland's "nine fair arches of stone" becomes visible. The building itself, which does this good service, is said to have been a chapel for mass, but it has undergone such changes that nothing of its original purpose could be guessed now from its outward appearance.

Bradford has two churches, one old and one new. The old church lies in an out-of-the-way corner, "bynethe the bridge on Avon Ripe," and attracts but little attention. It is a large structure, of various dates, but of no great interest to the sketcher. The modern world seems to attend the new church on the top of the hill. To the north of the old church is a small building of great interest to the antiquary, being nothing less than a real Saxon chapel. Many buildings used to be called Saxon which closer investigations have shown to be Norman; and even to this day vergers and other officials whose monotonous information was learned some twenty years ago, and has not been corrected up to date, will rise up in wrath if any doubt is cast on their cherished "Saxon" traditions. But this building at Bradford is a genuine example, and certainly no other style would care to claim a building so crude in design and so devoid of detail. To the historian or the antiquary it is full of interest, as being probably a relic of the Abbey of St. Aldhelm, founded here early in the eighth century.*

In the present day, and to the modern sketcher, more interest will probably attach to the house a little further west, now inhabited by the schoolmaster. It is a small but charming example of a Renaissance front. Nothing could be simpler or less pretentious, and yet we have here a house, hardly larger than a cottage, treated in a monumental manner.

One of the chief sights of Bradford is the "Duke's" or Kingston House, built by a family named Hall about the end of the sixteenth century. Leland says that in his time "Haulle dwelleth in a pratie stone house at the este ende of the toune *in dextra ripa Avonæ*," which would agree, so far as such a vague description can, with the site of the present house. The "pratie stone house" which Leland saw was an earlier building than anything we see now, for Kingston House is a very respectable example of the early Renaissance style, and Leland lived when Gothic was only just beginning to succumb. The Halls had lived at Bradford for a good many generations. Having started with a Reginald de Aulâ, they came, by way of the French equivalent De la Sale, to be plain Halls of Bradford. It is not known whether they were ever engaged in the historic trade of their town, nor can any one say with certainty which of them built the Jacobean house. They eventually died out, and through the female branch their house came into

* Plan, sections, and elevations of this chapel are to be found in vol. v. of the *Wiltshire Archæological and Natural History Magazine*, partly illustrating a very exhaustive paper on Bradford-on-Avon, by the Rev. W. H. Jones.

possession of the Dukes of Kingston, of whom there were but two. The second married a lady with a reputation not altogether to be envied. Princes and nobles were enamoured of her, but it would hardly be worth while to attempt to schedule her suitors together with the meed of success that attended their suits. It is quite enough for us to know that she sometimes lived in her husband's house at Bradford; and let us trust that she did not find it too dull. She married the Duke of Kingston before her first husband died; and, on the death of the duke, his relatives, in vindication of the eternal claims of morality and of needy connexions, caused the widow to be impeached for bigamy before the House of Lords. The trial was most magnificent, and attracted the exclusive attention of the fashionable world. In spite, however, of every proof, the enchanting duchess escaped without serious penalties and without losing her wealth. If, among the "Honourable House" who determined the case, were many of her rejected suitors, her escape is a great tribute to her fascinations.

Her house in Bradford was sold at the beginning of this century to a gentleman who erected a woollen-mill in the grounds by the side of the river. It was cut up into tenements and threatened to become completely spoiled, when, in 1848, it was bought by its present proprietors and carefully restored. Standing, as it does, on a terrace overlooking the valley, it presents a striking example of its style. Quite at the other end of the town, in a little suburb called Barton, stands a fourteenth-century barn, said to have been a tithe-barn, but which is also ascribed to one of the Hall family. If Mr. John Aubrey, who saw the place in the latter part of the seventeenth century, is right in thinking he saw on it the device of a hand holding a battle-axe, it is not at all improbable that a Hall did build it, since the hand with the battle-axe is their crest. The barn is like most others of the same date, well furnished with bold buttresses and long narrow slits to admit light and air. It has two transepts, each containing a large pair of doors, and a little one at the side, now fastened up. The whole building is striking and stately, though not so elaborately ornamented as those at Glastonbury, Pilton, or Doulting. Its enormous size serves to bring vividly before the imagination the fact that at one time tithes were paid in kind.

Besides these particular beauties, Bradford possesses a great number of eighteenth-century stone houses with handsome fronts,—an echo, probably, of the prosperity of the city of Bath, which is only some eight miles off. There is also, both here and in all the neighbourhood, a good deal of unpretentious ironwork, chiefly displayed in public-house signs. It all shows marks of the taste of last century (fig. 1).

Another feature of frequent occurrence is a stone porch or hood to the cottage doors. It consists simply of a moulded slab supported by two shaped brackets. The moulding of the slab and the shape of the brackets vary to a certain extent, but the type is the same everywhere, and frequently occurs in very small cottages which have no other architectural pretensions whatever.

About three miles to the north of Bradford is the village of South Wraxall, where the church, with its foreign-looking tower, at once attracts attention. The tower is the most picturesque feature of the building. Inside there is little of interest; but nevertheless every church ought to be entered, for what pleases one man has no attraction for another, and *vice versâ*. This church has been restored, and that might delight some people. Beyond the church, across some fields, and so far away as to engender a feeling of resentment at its being called South Wraxall at all, lies the Manor House. This was for many generations the seat of the Long family, some of whom lie obscurely buried in South Wraxall Church. The Longs seem to have owed their existence primarily to the Hungerfords, a powerful family living some five or six miles away at Farleigh Castle. Leland says that "one Long Thomas, a stout fellow, was set up by one of the Lords Hungerford; and afterwards, because this Thomas was called Long Thomas, Long was usurped for the name of the family." But whether this be so or not, it is very clear that the Longs were quite capable of taking care of themselves, and had a strong determination to see themselves well housed. The Manor House is a large rambling place dating chiefly from the fifteenth century. It is entered by a gateway having an oriel over it, and leading into a large quad, on two sides of which spread the buildings with cusped and mullioned windows. Most of them are empty, and may be visited on payment of a small fee. The exterior cannot boast much delicacy nor picturesqueness. The detail is a little clumsy, and the general effect appeals more to the artist than the architect; but inside there is a rich mine of work,—very late, it is true, but of great interest to all but unhappy pure Gothicists.

There are four or five fine chimney-pieces; a beautiful Jacobean screen, *in situ*; much wood panelling, stone niches, iron casement fasteners (figs. 2, 3, 4), and other delights, all to be sketched without let or hindrance so soon as the palm of the attendant sybil has been crossed. The chimney-piece in the hall bears the date 1598, which probably marks the time of the erection of all the late work. Another chimney-piece, upstairs, is an elaborate and handsome affair, reaching from the floor to the panelled plaster ceiling. It is throughout a mass of carving treated in a strictly architectural way, though much might be said as to the forms which have been used. In the over-mantel are four figures representing Prudence, Justice, Arithmetic, and Geometry. Arithmetic is thinking hard, while Geometry is very busy measuring a globe with some robust dividers. Two other rooms on the same floor have remarkable chimney-pieces, and over them all is a plentiful sprinkling of sententious Latin mottoes or posies, of which one states the well-known fact that "Death seizes all." In another part of the house is a panelled room in which are various pilasters with pedestals bearing a very charming design. The legend goes that Sir Walter Raleigh used to live here when he visited South Wraxall, and that it was in this very room that the first tobacco was smoked in England. But that reflection, though it may add interest to the house, in no way affects the detail. In this room, too, there is a good chimney-piece, at whose yawning chasm Sir Walter may possibly have lighted his pipe; and perhaps he knocked the ashes out against the little shields in the spandrels.*

THE "CAISSE DE DÉFENSE MUTUELLE" IN FRANCE.

The following *resumé* of the position among French architects in regard to the idea of a combination for the mutual defence of their professional interests was actually laid by M. Achille Hermant before the Congress of French Architects some months ago, the proceedings of which we reported at the time at some length,† but were compelled to omit some papers of much interest, for the report of which space could not be spared at the time. The interest of this view of the subject by a French architect is, however, exactly the same to our readers as it would have been then; it may furnish hints to English architects in regard to what should be their attitude towards each other and towards the public, and we need, therefore, make no apology for printing it now. We may premise that the full definition of the subject is "La Création, sous le patronage de la Société Centrale, d'une Caisse d'Assistance judiciaire, ou mieux de Défense mutuelle, destinée à venir en aide à ceux des membres de cette association qui se trouveraient engagés dans une procès par suite de faits relatifs à l'accomplissement de leur mandat, lorsque de ce procès pourra resulter une décision judiciaire sur une question de principe ou d'intérêt général pour la profession d'architecte" :—

Before entering on the main question itself, M. Hermant showed that it was naturally connected with the views expressed by M. Wollon at the last conference on the subject of public competitions, and he pointed out how unfortunate it would have been for the whole body of architects if, through hesitation or want of means on the part of those immediately concerned, MM. Malpieu and Montier, in 1846, and M. Henri Parent in 1882, had not obtained the two remarkable decrees of the "Cour de Cassation," so valuable to our profession, in that they limit the responsibility of the architect and the time during which he may be sued. M. Hermant reminded his hearers that the case of the "Comte de Bearn contre Henri Parent" lasted nearly ten years, and that the defendant was obliged, with varying results, to go before the "Tribunal civic de la Seine" and the "Cour d'Appel de Paris," and afterwards to the "Chambre civile de la Cour de Cassation," then to the "Cour d'Appel d'Amiens," to return to the "Cour de Cassation," but before the "Chambres réunies," which last issued at length a decisive decree.

What, said M. Hermant, would have been the result if in the place of M. Parent, a man of distinguished position, there had been a young man of little experience and unable to defray the expense of such a law-suit, and who, after gaining more or less advantage in the course of the transaction, would have been forced to withdraw without bringing the Supreme Court to a decision?

The proposed "caisse," on the board of which are Messrs. Rolland, president, and Chas. Lucas, secretary, involves the formation of a society with a special aim, and distinct from the Central Society, though supported by it and including a great many of its members.

We give below the principal articles of the proposed statutes:—

Art. 1.—An association of professional architects is founded, by application of the law of March 21, 1884 (law of professional syndicates), under the patronage of the central Society of Architects, for the defence of professional interests involved in suits by or against members of the association before judicial or administrative tribunals. This association will be entitled:—"Caisse de Défense mutuelle des Architectes." It will be constituted when it shall have received the adhesion of 300 members. It will have its centre in Paris.

Art. 2.—This association has for its object to defray the costs incurred in defence of their rights by those of its members engaged in legal proceedings,—by reason of the exercise of their profession of architect,—when the proceedings relate to a question of professional interest. The association will hold aloof, on the other hand, from disputes relating to questions purely personal.

Arts. 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12 relate to the recruiting of the Society and its resources, and to its administration by a committee.

Art. 13.—Every application addressed to the association must be accompanied by,—1st, a memorandum containing a complete statement of the subject; 2nd, all documents necessary for the examination of the same. The candidate may offer explanations in person to the committee, or appear through a representative of his own choice. The decision of the committee will be given, at latest, during the month following the receipt of the formal application, unless a delay be necessary to ensure more ample information.

Art. 14. The application may be preferred at any stage of a suit, and on any ground which the candidate may think proper in the case in which he is interested. If a valuation has been directed, the applicant may demand the appointment by the committee of one of their members to assist in the valuation, and to draw up a report to the committee before it decides on his application.

Art. 15. The committee will decide to accept or reject the application; but it may, in exceptional cases, admit it in part. In all cases it will reserve the right of adjusting, in due proportion, the expenses to be defrayed by the "Caisse de Défense mutuelle." The decision of the committee will be final.

Art. 16. The acceptance by the committee of an application will bind the "Caisse de Défense mutuelle,"—first, to contribute to all judicial expenses, fees of advocates and attorneys, and the cost of the valuation or survey which the associate may have brought forward on his account; second, to indemnify him for judgments in costs, and expenses of the valuation or survey made by the other parties, and operating against him. If, after a negative decision of the committee, the character of the suit should be modified so as to raise a new question of professional interest, the associate interested may renew his application, which must be re-investigated; or the committee may in this case make a new decision without the application being renewed. The committee should have the new question brought under its consideration before the associate interested carries or accepts discussion before a new jurisdiction. In this case, the application and documents should be addressed to the committee, and it will decide

* To be continued.

† See *Builder*, vol. xlvi., pp. 893, 941.

with the least possible delay, so that the applicant may be able to act in good time.

Art. 17. Associates reserve the free choice of council under all jurisdictions.

Art. 18. The costs of judgments pronounced against associates on the main points will in all cases be defrayed by themselves. Judgments for costs which they may obtain should, after being paid in, revert to the "Caisse de Défense mutuelle," to the amount of its advances.

The projected statutes terminate by divers articles relating to the modification of the statutes and the dissolution of the Society, and after the reading of them, M. Hermant proposed that, as was done by the Central Society of Architects met in council and general assembly, the Congress should also adopt the principle of co-operation applied to the defence of professional interests, reserving discussion of the question and its details to a future occasion.

The question was raised at the time by a speaker, who in general supported the project, whether there were anything analogous to the proposed "Caisse" in other professions, and in reply, the existence of the "Chambres syndicates de Patrons et Ouvriers" was cited, and also of other professional syndicates, which were established with the view of defending the general interests of the profession, or the special interest of members; and further, the great moral support given by the order of advocates to each of its members, as against the magistracy. In a somewhat similar manner the *esprit de corps* of the profession of the Bar in England has been cited as an example which might be well followed by the architectural profession in this country.

Since the French Congress at which the subject was discussed, the rules and statements of the method of action of the proposed society have been printed for circulation, and probably we may hear further of the subject before long.

SEMPER'S THEORY OF ARCHITECTURAL ORNAMENT.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary meeting of this Institute on Monday evening last, Mr. David Brandon, vice-president, occupied the chair, in the absence of the President, who had accepted an invitation from the Architectural Society at Leeds.

Mr. Lawrence Harvey read a paper on "The late Professor Semper's Theory in Relation to Architectural Ornament." Semper, he said, before beginning his book, gives his theory of beauty, so that his readers may know the exact meaning he attaches to the terms he employs. After giving his definitions of science, religion, and art, he states that on the general lines of nature are founded architecture and music, which are therefore cosmic, and not imitative, arts. The imitative arts, even the feeling for the beauties of nature, he contends, are dependent on these cosmic arts. A man of culture, in looking at nature, conjures up a scene, by which he completes what he sees into a harmonious whole; this is exactly what the painter, the sculptor, and the architect do for us, and as we gaze at their creations we forget for a moment our own selves, and are lifted above the imperfections of existence. In nature and art an object stands out clearly before our attention, when it has individual characteristics; but when the object is scarcely distinguishable from its surroundings, our impression is blurred. In the lowest forms of creation,—crystals, for instance,—the individuals are entirely disconnected with the rest of the universe; they have nothing in their shape which relates to surroundings. The centre of a crystal is the centre of an attraction to which all its parts converge, and around which they distribute at regular intervals, thus illustrating the law of Eurhythmus, which we obey whenever we wish to cut off an object from its surroundings by a frame, and thereby heighten its importance, be the object framed the neck of a fine lady, or the rude mystic symbol of a Druid's temple. A Eurhythmical object raised on one of its sides forms, in relation to its basis, a symmetrical figure. Plants give us the idea of proportion as the result of the conflict between their vital power and the attraction of the earth. In animals we find another characteristic of individuals viz., direction, a result of the conflict between their will and the resistance of either inertia or the medium in which they move. Eurhythmus, symmetry, proportion, and direction are the fundamental elements of form. In nature is also found the law of subordination, and artists, like nature, are wont to indicate the purpose of their works by subordinating symmetry to proportion and attraction, or *vice versâ*. Many authors, in searching for the origin of architecture, have started with the idea that simplest forms are the oldest; but just as it has has been found in the comparative study of languages, that our poorer dialects are the descendants of richer stocks, so it is with architecture, what seems to be primitive is only derived many times over. In the research into the origin of architectural forms, chronology is no guide,—a primitive form of art may endure in one country centuries after it has entirely disappeared from another. The Egyptian bas-reliefs, which are older than those of the Assyrian palaces, yet belong to a later development of art; their apparent stiffness and primitive simplicity are designed in accordance with the religious principles of the Egyptian priests. Wherever traces of monuments are to be found, of whatever time and country, certain features can be observed, which, however modified, are essentially the same. We may conclude therefore, that these features are older phases of social organisms, consequently the primitive features were borrowed from the processes of the technical arts and trades. They obtained a symbolical meaning, religious or ornamental, but nevertheless their original purpose has never been entirely forgotten, and still influences the architectural features of our day. To the study of the formation of these types we must turn our attention if we want to catch architecture at its source. Every work of man is the result of two primal conditions,—firstly, the purpose he wishes to serve, and secondly the stuff or material, and also the construction and technical processes, he employs. As the purpose of all work remains the same in all times, being based on the wants of men, which change not, the study of the influence of purpose on the form of the objects leads to the consideration of their general shapes. On the other hand, the materials and the technical processes change in the course of time. In discussing how they modify our works we discover what we call style; that is to say, rules special to each case. A band, for instance, is a strip of stuff wound round something to bind it. This is the general character of a band; but how a band is to be fashioned, according as it is made of flax, leather, or metal, is a question of style. There is a third element which enters into the formation of the works of men, an element which varies infinitely, and therefore affects style; that element is the degree of culture, particularly the religious, philosophical, and political theories of the men for whom and by whom different works and objects are made. This is a big question, which Semper reserved for the second part of his work on Style, which has never been published. The writer then went on to classify the technical arts and trades, dividing them into (1) the Textile Arts, (2) Ceramic Arts, (3) Tectonic (Carpentry, Joinery, &c), and (4) Stereotomy (Masonry, Carving, &c.). Carpentry, according to Semper, is applicable not only to works in wood, but to some structures in stone, as in Greek architecture, and to some forms of metal construction. Stereotomy comprises carving of any hard metal, and even modelling. As for the textile arts, they are connected with ceramic art in tile pavements, with carpentry in lattices and wainscoting, and, in fact, with all parts of architecture by the principle of clothing constructional parts, a principle which is the primary idea of all decoration. Semper succeeded in showing that the clothing principle governed the arts,—and especially architecture,—up to the Gothic period, when, according to him, the building principles of antiquity were abandoned. The ancient Gothic architects emphasised the constructional parts of a building by making it wear, according to Semper, its ribs outside its skin. When textile products are used in the form of surfaces they serve the purpose of covering, protecting, and inclosing, and as such are the oldest representatives of those abstract ideas. They are, says Semper, the primitive models of our floors, ceilings, and walls, and, starting from this point of view, he devotes many chapters to the treatment of architectural details. In any room the most brilliant effect of colour, he maintains, should be reserved for the ceiling. There are many reasons for this; firstly, the surface of the ceiling is not disturbed by any utilitarian purpose such as are the walls. Thus a painting on the ceiling is never too close for proper inspection; hypercritics cannot pry into details, and the impression on the spectator is as vivid as it is necessarily cursory. Pictures on the walls, on the contrary, are blurred by the chromatic spectrum of complementary colours, which we perceive whenever we fix any given colour too long. Speaking of colours, Semper says, there are only two systems of decoration; the one rests on the equiponderation of colours by which a richly homogeneous, yet quiet, effect is produced; the other is the Greek principle of subordination, wherein colours are toned so as to bring out a culminating effect or climax. The process of sewing teaches us an important principle of design, never to place pictorial subjects, be they painting or sculpture, in a part which has a constructional purpose, but to reserve them for neutral fields, such as the pediments and metopes. The knowledge of the knot probably preceded that of sewing, and, curiously enough, the knot is to be found in all countries as a religious symbol. The button is also a kind of seam, and may be the prototype of rivets and rosettes. To the wearing of skins of beasts can be traced the heads of Egyptian gods, as well as the masks and other animal attributes used in antique architecture and furniture. A comparison of ornamental leather wares with our own is an excellent study to initiate us into the refinements of good style, and thereby is indirectly useful to the study of architecture. To the introduction of silk from Babylon we owe the mystic beasts or monsters so often found in Byzantine ornamentation; gold brocade in which there is a brilliant surface as a background to a still more brilliant pattern; damask or ornamentation based on gradations of gloss, reminding us of Moorish architecture; satin and velvet, the special delight of the Renaissance, as shown in the paintings of Titian, Paul Veronese, and Holbein. The textile products are the leaders which have fixed the chromatic scale of coloured decoration. The connexion between costume and architecture is of two kinds: on the one hand, architecture derived the style of its ornament from dress; on the other hand, it bears with dress the impression of analogous influences, such as the taste, character, and civilisation of a people. The paper then referred at some length to the clothing principle in architecture and to the important position which China holds in regard to the study of the origin of art. Could we see Pompeii as it was 1,800 years ago it would strike us, in many respects, as very Chinese! The opinion that India is the cradle of mankind does not agree with the tale told by its architectural remains, which point to a mixed style derived from various sources. When the oldest written documents are consulted it is found that Indian art was most complicated and rich in forms; wood, brick, stone, metal, and stucco were already in use, and each of these materials brought its contingent and special features. But the one which seems to have had the greatest influence on Indian architecture is stucco, for the over-laid ornamentation on Indian monuments is nothing but stucco work laid in stone. The paper described a Buddhist Convent in Ceylon, built about 200 years before Christ, — brick buildings supported on stone columns 12 ft. high, portions of the structure being covered with the most precious materials; the columns decorated with sculptures of lions and other beasts, as well as gods. At the present time one could see these columns with traces of stucco, which proves that the sculpturesque ornamentation spoken of in the description was obtained by stucco. Semper is induced by this discovery to enunciate the very bold hypothesis that the dolmens and stone circles of Stonehenge and Brittany were but the kernel of stucco structures. They are, to what existed, just what the iron framework of a clay statue in a sculptor's studio is to the statue itself. Referring to later times, the lecturer said that while smiling at the clothing of columns, we little thought that the column itself was but the clothing of a post, hull over hull, such is Semper's definition of the progression of art. The fact that Classic architecture needs the help of upholstery Semper reckons as a great point in its favour, as a means of heightening the effect of a building on great occasions. Reference was next made to the art of Chaldea, and the clothing principle as expressed in the alabaster

dados which decorate the walls of the interior chambers of Nineveh. The Assyrians appeared to have used metal, either hollow or as casing, on wood framing, thus forming a strong contrast to the Egyptian metal-work, which was solid, and made in thin bars. The metal plating and hollow work appeared under three forms: firstly, on square framing; secondly, a circular section of kernel with corrugated plating; and thirdly, a plating of thin metal pressed out on a lathe like tinware, and used only for vertical supports. A very much later example of the evolution of metal-work out of the casing of woodwork could be seen in the case of two bronze doors at Rome,—the one, from the temple of Remus, followed exactly the original wood panel construction; the other, from the Pantheon, presented outwardly the appearance of panel work, but was really made of one piece of hollow metal. In an upper room of St. Sophia there is an example of metal casing such as was probably used by the Assyrians. The clothing principle had evidently been applied to the construction of the terraced walls of Assyria. Semper concluded that the bricks were laid together on the floor after being sun-dried, and the whole surface was then painted over with enamel colours. When the colours were dry, the bricks were built up in their proper position on the wall, according to the numbers marked on their backs, and the colour was burned in by making a large fire within the chamber, so that the invention of burning clay to harden it into brick may be due to the experience obtained in fixing the colours thereon by fire. What the colour of the alabaster relievos might have been it was impossible to say, but Semper felt assured that they were left neither naked nor coloured, like the Assyrian Court of the Crystal Palace. He was inclined to believe they were gilt, and decorated with encaustic wax colours. Reference was made to the description of Ecbatana by Herodotus, in which we find there were seven concentric walls, rising one above another, each painted with a different colour, viz., white, black, purple, blue, orange, silver, and gold. Mr. Harvey referred to the stone-work of the Temple at Jerusalem, which Josephus affirms had a casing of wood and gold. The clothing principle was an essential characteristic of the Pyramid. The lecturer also touched upon the history of Roman architecture, which, like that of the Roman Empire, was split into two portions. The Christian architecture of Byzantium was the old Roman architecture invested with the spirit of an Oriental court. In the West the church was not only free, but mistress. The sensual decorations of pagan art were abandoned, and as the structure could be bared of its clothing, the construction and the material rose into artistic importance.

In the course of the discussion which followed,—

Mr. Geo. Wallis (South Kensington Museum) said he had the pleasure of being associated with Semper during the time of his connexion with the Science and Art Department. Semper's views were comparatively new in England. The fact was that from 1836, the period at which the Parliamentary Committee was formed to inquire into the relation of art and manufactures, there had been a considerable agitation as to the necessity for schools of design and museums. Therefore when Semper came to England he found a small body of men who could sympathise with him in his efforts. The centre of this body was the late Prince Consort, who, he believed, was the means of bringing Semper to England. Semper's views were considered novel by those who, like him (the speaker), had been studying the question not so much in relation to architecture, as in its bearings on the textile manufactures. At that time there were many points in Semper's theories which he could not quite see his way to accept, but the Professor's earnestness and zeal made him feel that it was rather for him to inquire than to dispute. Semper's position was practically experimental in this country, but men like Sir Digby Wyatt and Owen Jones associated with him, while not accepting his theories. His was a voice really crying in the wilderness, and in the end he accepted the offer of a professorship at Zurich. Some of his theories in relation to the origin of design were rather far-fetched, but there were others again which seemed to be perfectly true, and worthy of every consideration and study. An English translation of the book would be of immense value at the present time to those arts in which they were all more or less interested.

Mr. Slater remarked that some of Semper's conclusions appeared to him very startling. He had only had the opportunity of glancing through the book, but it seemed there were two or three points to which it led. The great thing was the importance of textile manufactures. In any inquiry into the life of early nations, all students had come to the conclusion that a great deal would be gained by an examination of the savages who at the present time are in a condition somewhat analogous to the early inhabitants of the earth. All savage tribes have a passion for personal adornment, so that Semper was doubtless right in saying that the adornment of the person was the starting-point of ornamentation generally. Semper said that clothing was the starting-point for ornament, but as civilisation had spread from warm climates where clothing was not a necessity, to colder ones where it was, it seemed a striking instance of a man letting his theory run away with him. It seemed to be an inversion of the whole thing to say that the discovery of tattoo marks on some savages of the present day, similar to certain figures on antique metal-work, showed that the tattooing was the descendant of the more cultivated forms. With regard to the evolution of columnar architecture from wooden forms clothed with metal, Semper seemed to argue from the statue to the column. At the time of Pericles, Pheidias, in his two great works, used not stone, but metal, ivory, and various other things to represent the figures. They did not know the reason for this, but there must have been one for the sculptors of Greece at the height of its art and prosperity choosing to do this. Twenty-five years, however, before the time of Pheidias, temples were existing with stone columns, and nothing to show that their forms had been covered with bronze. He agreed with Semper that clothing was the origin of everything as far as colour was concerned. Mr. Slater concluded by proposing a vote of thanks to Mr. Harvey.

Mr. Stannus thought it possible that Carlyle's "Sartor Resartus," which appeared shortly after Semper's book, might have been intended as a satire upon it. The book would be exceedingly valuable if it gave more *technique*. The world would not stand still to learn archæology or to read books on evolution. At the same time Mr. Harvey would be doing a good work if he translated Semper's book.

Mr. William White, F.S.A., seconded the vote of thanks, which was carried by acclamation.

Mr. Harvey, in replying, said that about fifteen years ago he had a great many doubts as to Semper's theories, but the more he investigated them the more he got sucked into the theories, so that now he was a believer in them. This was the best answer he could make, for if they studied Semper's book they would go further on his road than they had anticipated.

Illustrations.

DOORWAY OF "LA MADELEINE," VÉZELAY, YONNE.

THE French Government instituted, about four years ago, in the left wing of the Palace of the Trocadéro, at Paris, a museum of casts chosen from amongst the finest specimens of ancient sculpture (from the eleventh to the sixteenth century). This museum, in which things are methodically classed according to the system employed by the late Viollet-le-Duc, is called "Musée de Sculpture comparée," or "Musée Viollet-le-Duc."

The visitor, on entering the first hall, in which the casts from sculptures of the eleventh and twelfth centuries are exposed, has before him a magnificent double doorway, which occupies all the further end of the hall, and through which the neighbouring hall opens. This doorway is the reproduction of that of the abbatial church of the Madeleine, at Vézelay, in the department of the Yonne. The doorway has been so cleverly executed that one would really believe that it had been brought stone by stone from Vézelay, and re-erected in the Palace of the Trocadéro. The colour of the stone, the weather-beaten tinge, the very mouldiness caused by the damp, all has been reproduced with marvellous exactitude.

The casting of the whole doorway occupied the artists and their workmen about four months. I was at Vézelay at the time, and followed the whole operation with the utmost interest.

The sculptures that decorate the tympanum are very curious indeed, and of great decorative effect. They are, moreover, very much more interesting when seen close by than when taken as a whole from some distance. Each fragment as it was cast disclosed many interesting details that were altogether lost when seen from afar. New discoveries were of daily occurrence,—curious details in the costumes, the shoes, instruments, jewelry, &c. Amongst other things, we may remark a reaper with a scythe, similar to those still in use, a flail of quite modern aspect, and shoes which seem to have been copied from those of the neighbouring shoe-shop.

The artist engaged in this most interesting work having kindly put at my disposal each fragment as it was cast, I was able to copy them, and I published in the journal *L'Art*, of Dec. 15, Dec. 24, 1882, and Jan. 14, 1883, a series of thirty-six drawings, with a notice by M. Havard, which highly interested the artistic world.

"La Madeleine" was the church of the abbey of Vézelay. The abbey was founded and erected primitively at St. Père-sans-Vézelay by Gerard of Roussillon, who, as M. Havard maliciously relates, "was taken, at the close of a somewhat troubled life, with one of those fits of devout fear that have so often proved profitable to the Church, and also to the faithful servants thereof."

Pillaged and destroyed in the ninth century by the Normans, who, after having ascended the Seine and the Yonne, ravaged also the valley of the Cure, the abbey was definitively erected on the hill-top, so as to be more easily guarded and defended.

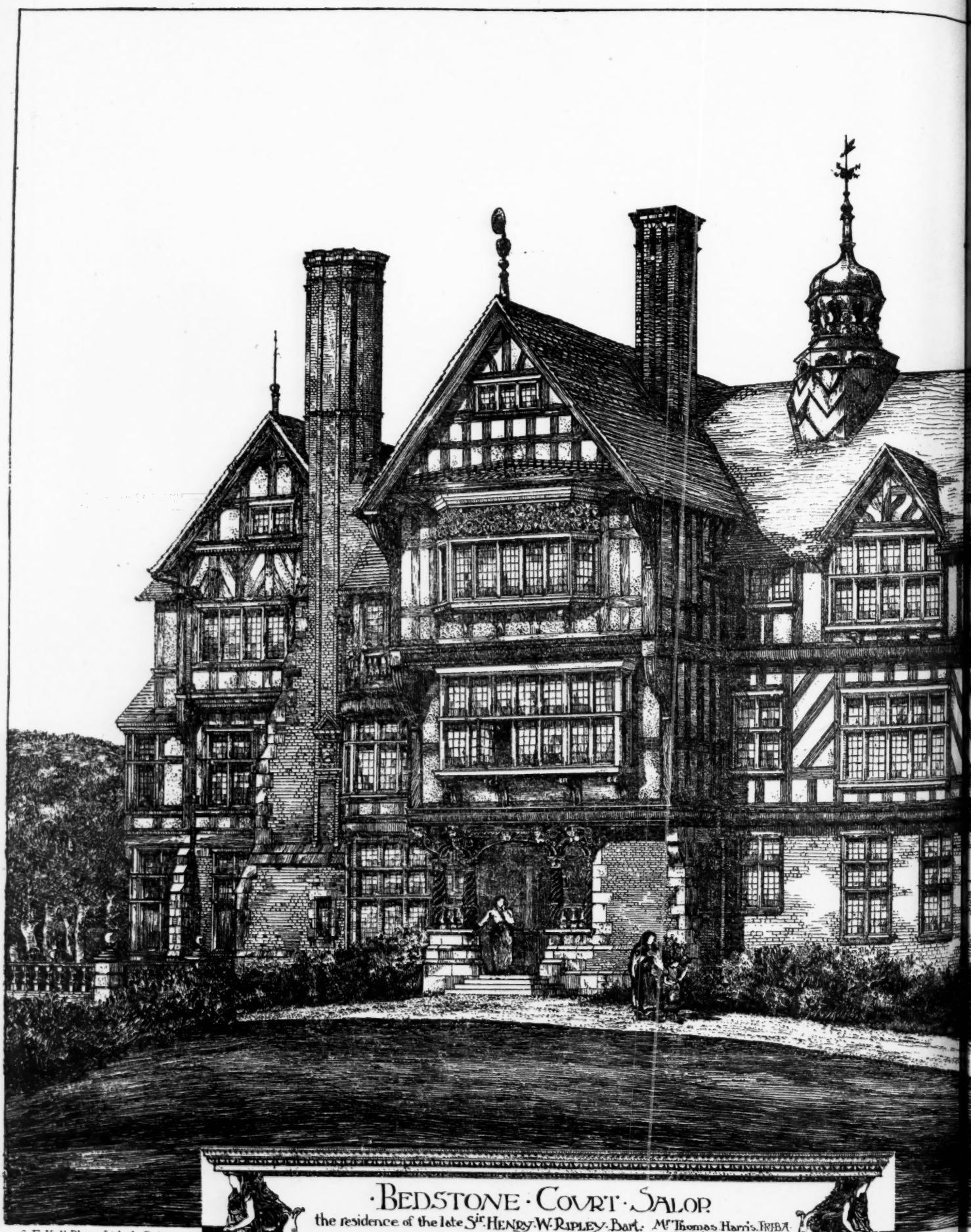
The liberalities of the pious and candid pilgrims that from all quarters assembled to pay their devotions to St. Mary Magdalene, and never failed to leave a peace-offering, soon gave riches and renown to the abbey. It was visited by King Charles VII., by St. Louis, Philippe-Augustus, Richard Cœur-de-Lion, king of England; Thomas-à-Becket, archbishop of Canterbury; and other personages of mark. Many of the high barons, on their way to the Holy Land, passed through Vézelay in order to visit the celebrated shrine, and also to procure money from the numerous bankers and money-changers that resided in the town.

The doorway of the Madeleine, of which we are speaking, dates from about the middle of the eleventh century. It gives entrance from the narthex or church of the catechumens into the principal church, by a double opening. The two halves of the doorway are separated by a pillar of most exquisite style, which supports a statue of St. John the Baptist, holding in his hands a mutilated disk. This disk was originally a broad nimbus which surrounded a Pascal Lamb, fragments of which are still to be seen.

Above the pillar and jambs there are two lintels, on which are sculptured a goodly number of personages, which have puzzled archæologists for many a day, and of which even M. Prosper Merimée was obliged to declare himself unable to furnish a plausible explanation. What could the artist have meant to represent by these long-eared folks, or this other personage with a shell on his head, or, again, by this stunted dwarf, who must needs use a ladder to mount upon horseback? (*See Illustration.*)

In the centre of the tympanum Christ is represented in considerable dimensions, surrounded by the twelve Apostles, each having a nimbus. This statue is clad in the ancient *peplum*; the Apostles are robed in Oriental garments.

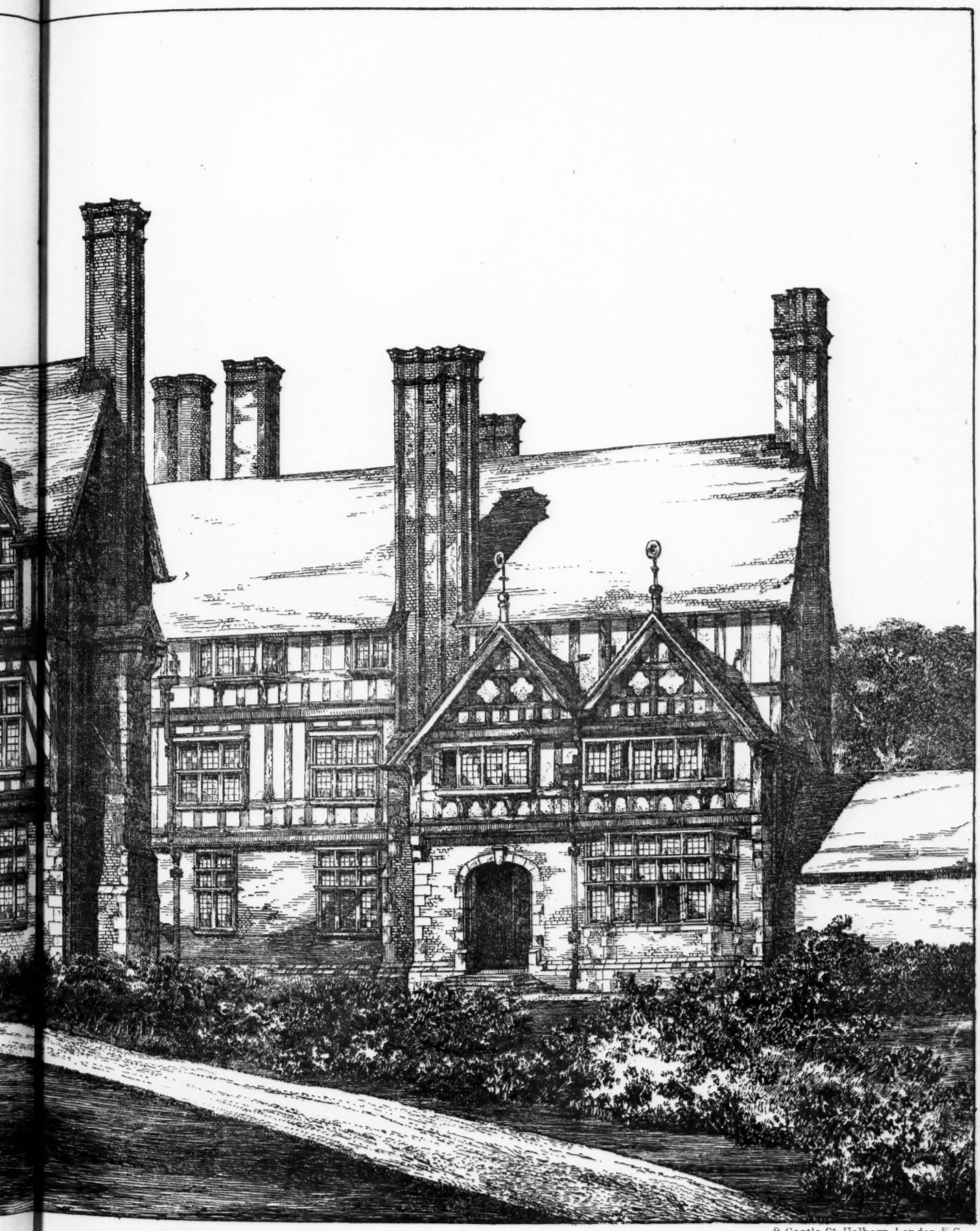
Above this magnificent tympanum there are three archivolts. The first is divided into eight "Passions," in which are represented different scenes and figures, more incomprehensible still than those on the lintels; scribes are to be seen leaning their "scriptional" or writing-table on their knees; human bodies with animals' heads, others with almost human faces, only adorned with pig-like snouts; one personage is arrayed in Persian attire, another looks like a Russian moujik, others have ancient Roman garments, and others still, standing upon high clogs, are dressed somewhat like modern Turks, and bear great resemblance to the natives of the countries that lie around the Black Sea.



·BEDSTONE·COURT·SALOP.

the residence of the late Sir HENRY W. RIPLEY, Bart. Mr Thomas Harris, FRIBA. Architect.

C. F. Kell, Photo-Lith & Printer.

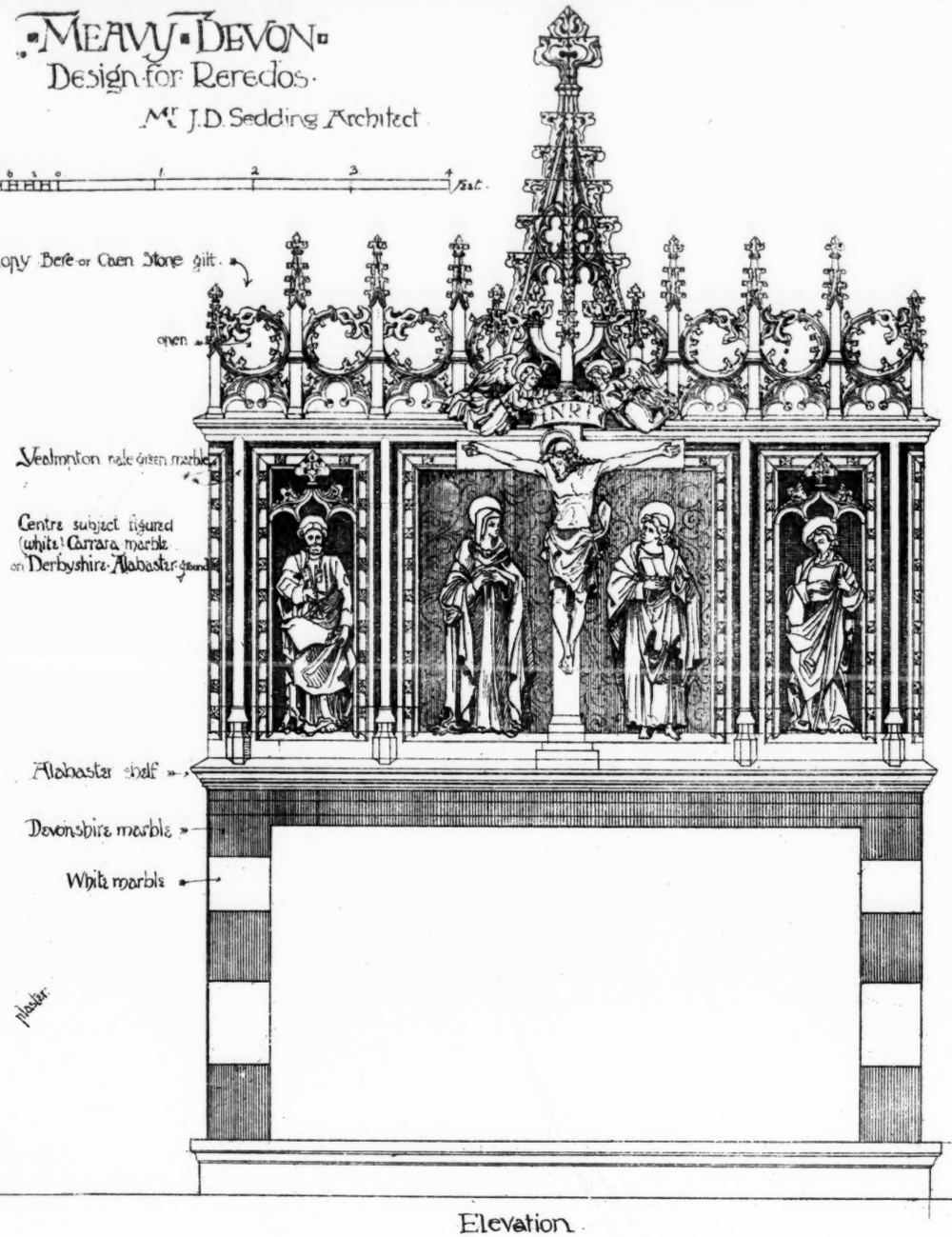


8, Castle St Holborn, London, E.C.

MEAVY · DEVON ·

Design for Reredos.

Mr J.D. Sedding Architect



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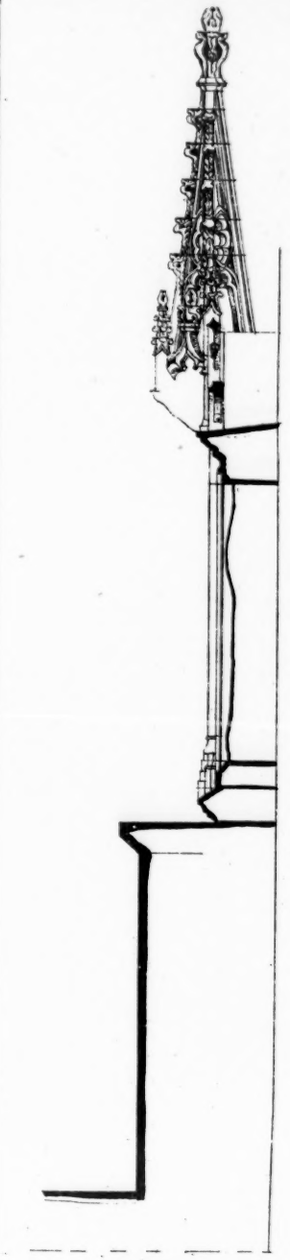

Section.

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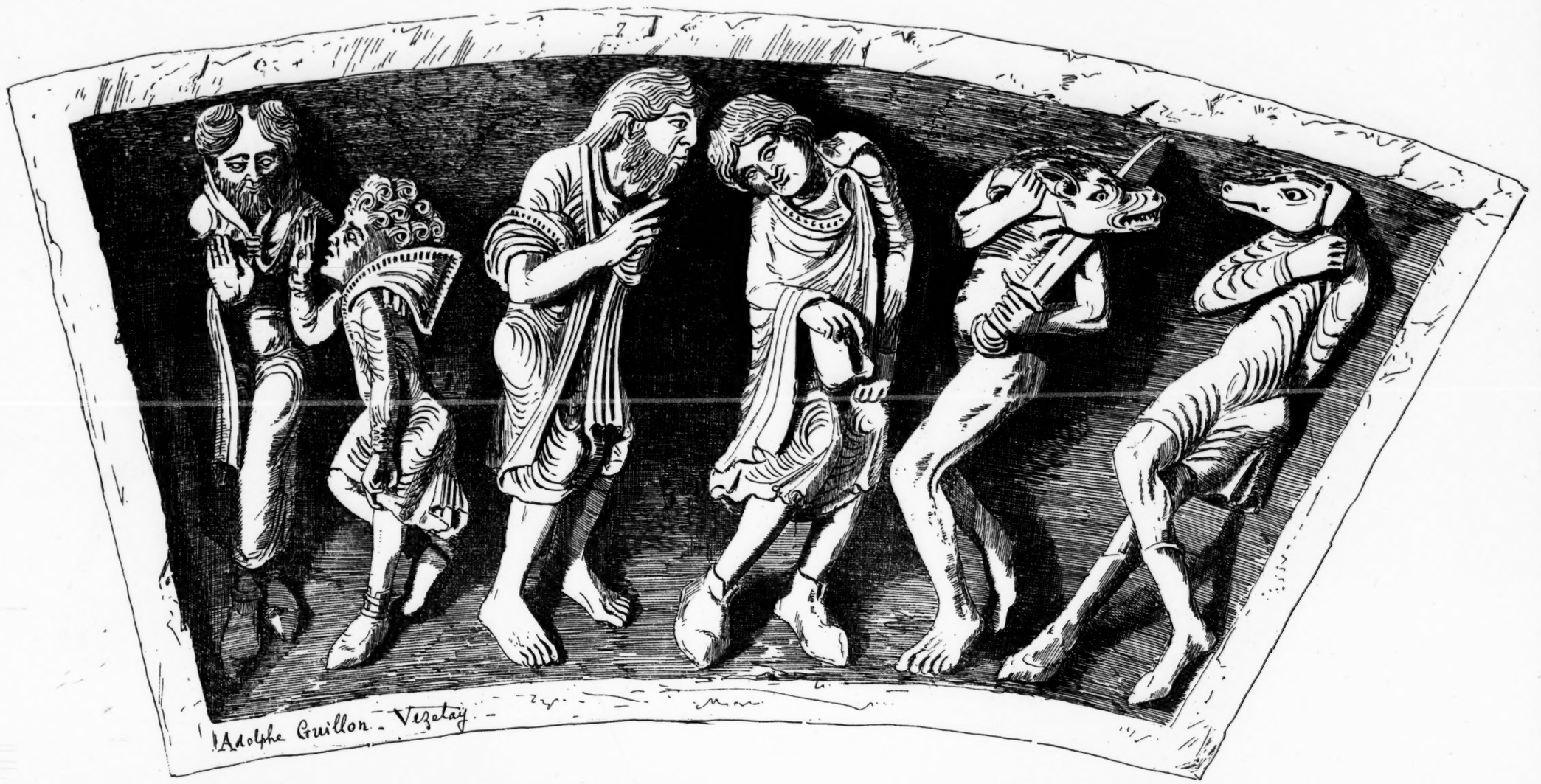

SCULPTURE FROM DOOR OF NARTHEX, LA MADELEINE, VÉZELAY.

DRAWN BY M. ADOLPHE GUILLON.

Wyman & Sons, Photo-Litho.

C^t Queen S^t London, W.C

SCULPTURE FROM DOOR OF NARTHEX, LA MADELEINE, VÉZELAY.

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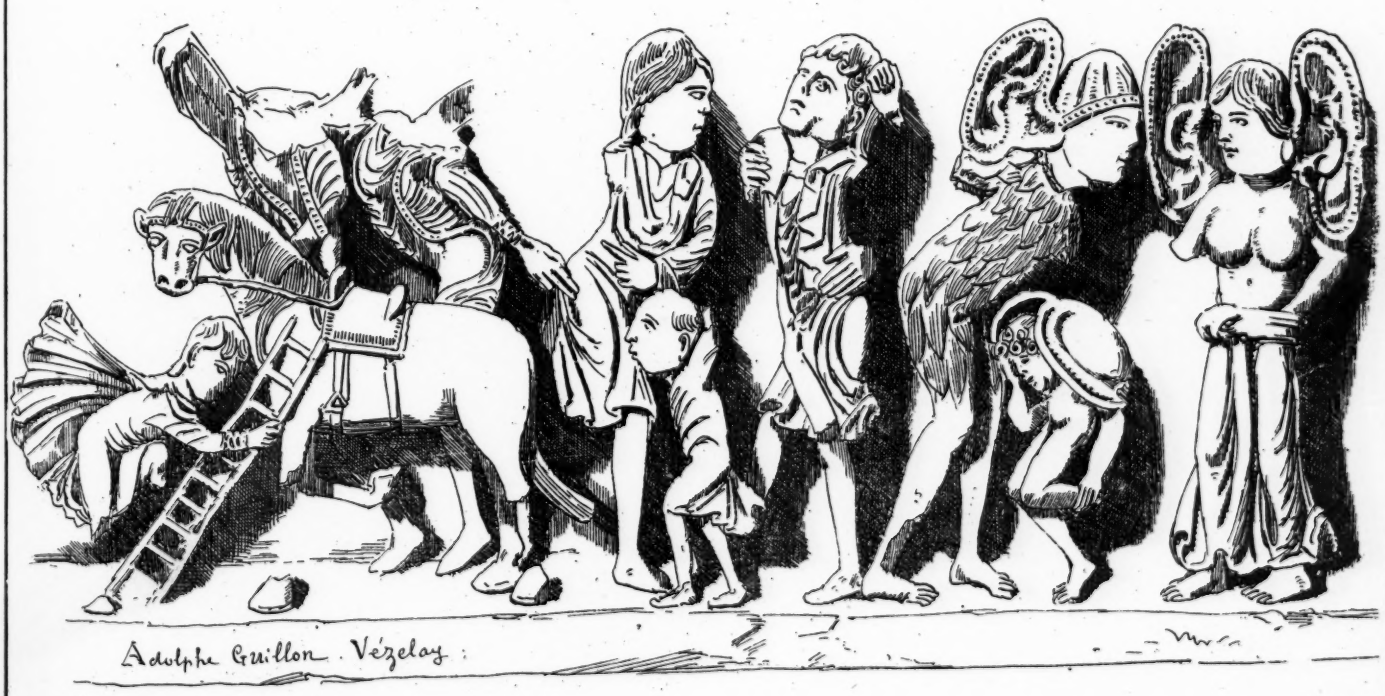


SCULPTURE FROM DOOR OF NARTHEX, LA MADELEINE, VÉZELAY.

DRAWN BY M. ADOLPHE GUILLON.

Wyman & Sons, Photo-Litho. 74 Queen St. London, W.C.

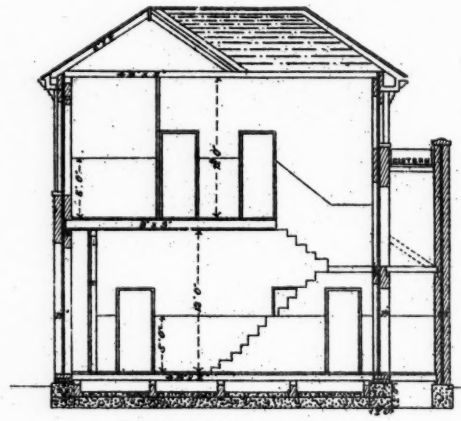
SANITARY HOSPITAL *FOR THE DISTRICT OF THE*

BOURNEMOUTH COMMISSIONERS.

G. R. Andrews. Surveyor. Jan.y 8th 1884

N.W. ELEVATION.

ADMINISTRATIVE BUILDING



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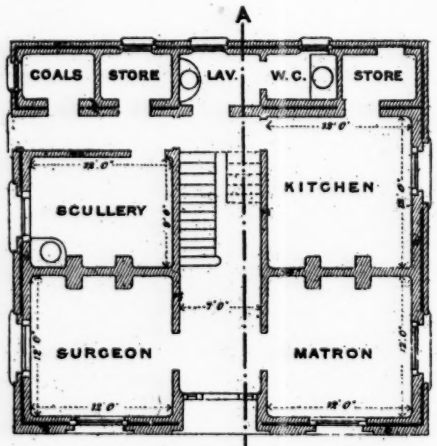
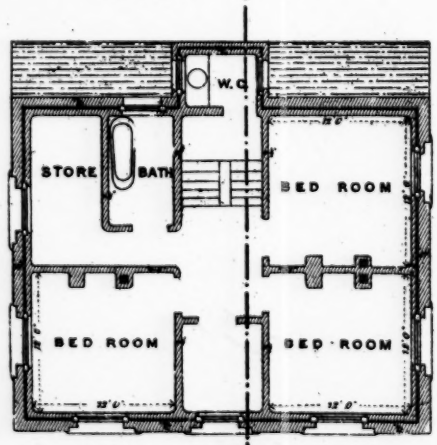
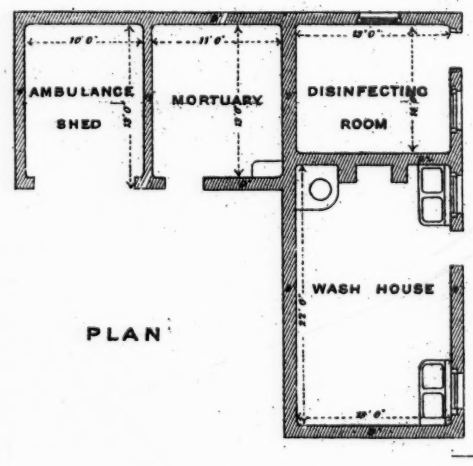


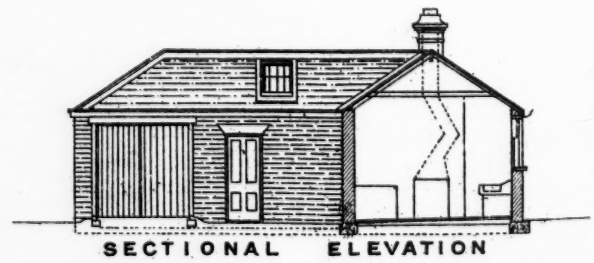
GROUND PLAN



FIRST FLOOR PLAN



PLAN



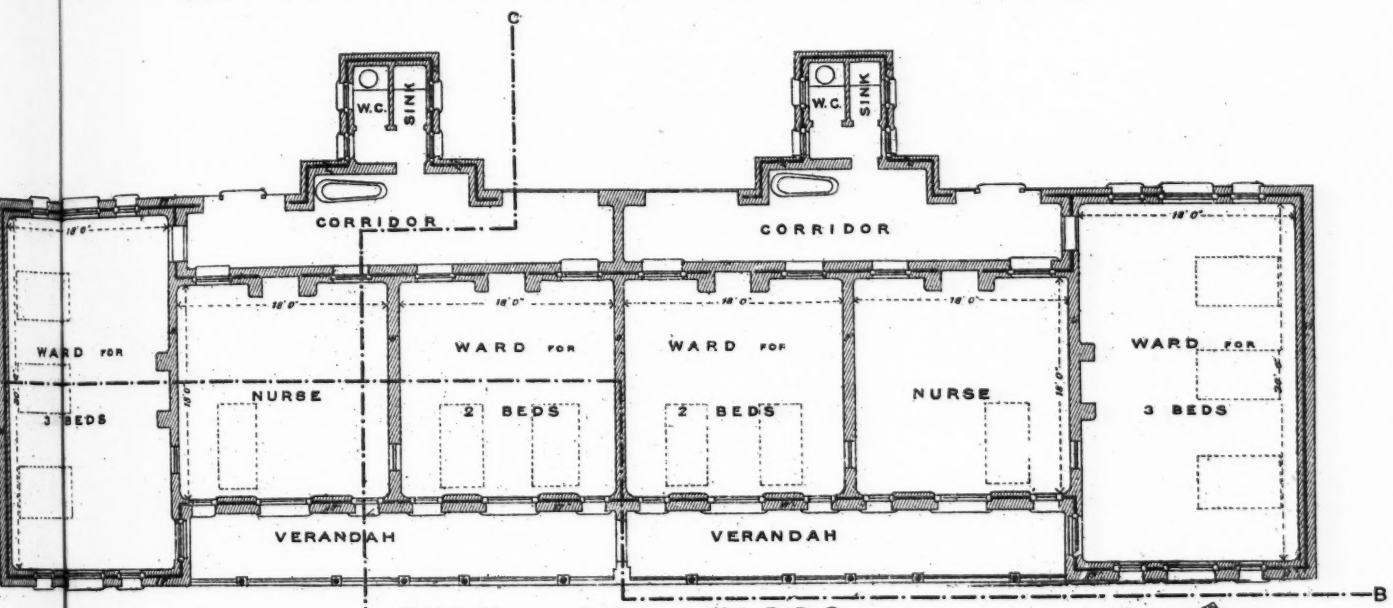
SECTIONAL ELEVATION

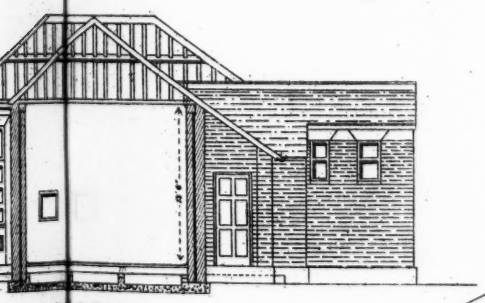
Scale to Plan and Sections 10 3 0 10 20 30 40 50 60 70 80 Feet

Scale of Block Plan 100 50 0 100 200 300 400 Feet

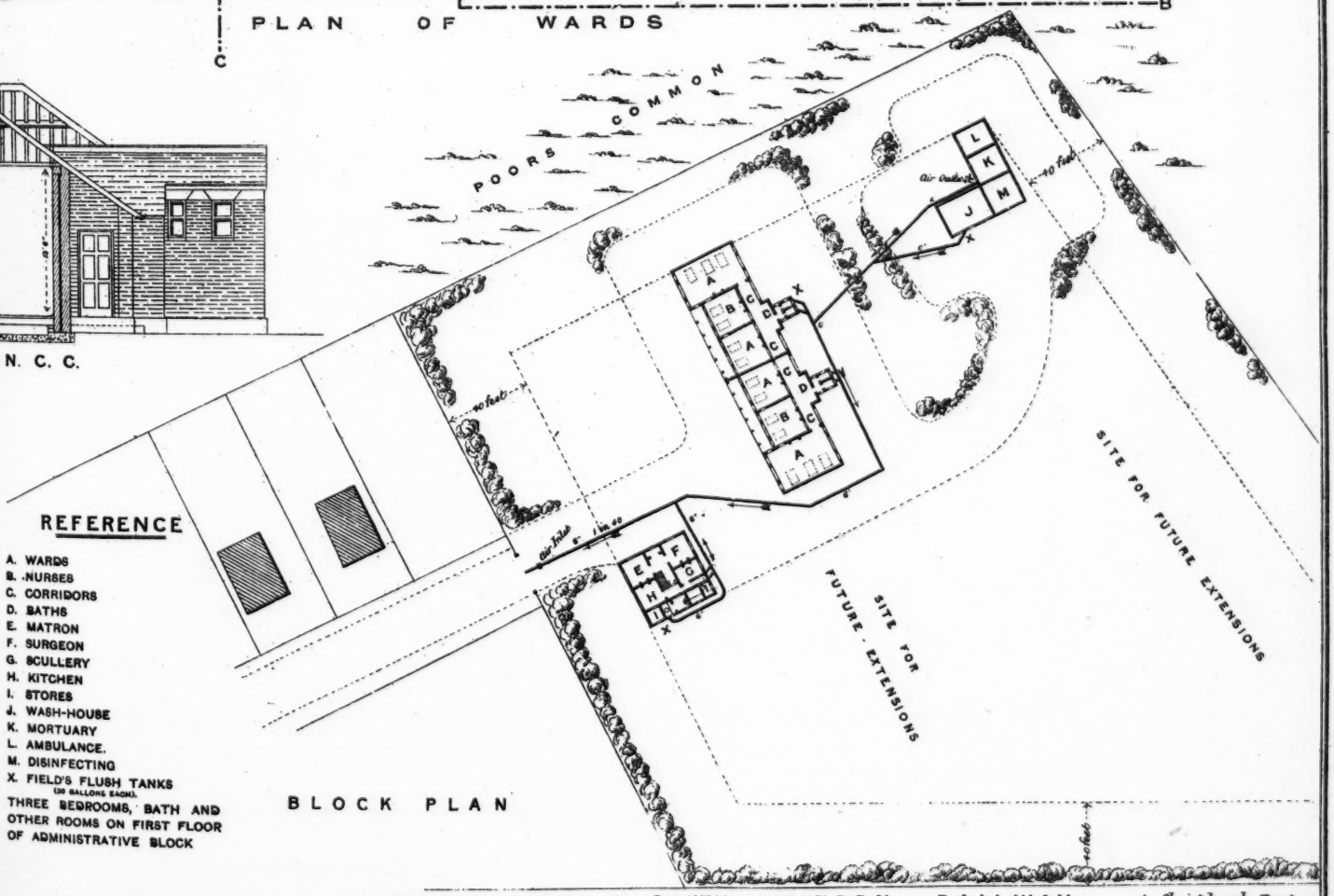
Wyman & Sons, Photo-Litho.

SECTIONAL ELEVATION OF WARDS B.B.





SECTION. C. C.



C^t Queen S^t London, W.C.

The diversity of these figures led M. Viollet-le-Duc to the belief that this tympanum meant to represent all the different peoples of the earth called together by the Apostles in order to hear the teachings of the Divine Master.

The second "archivolt" is composed of twenty-nine "medallions," in which are represented alternately the signs of the zodiac and agricultural scenes, particularly the culture of the vine and of corn. In the first of these medallions we see a man about to cut a slice of bread with a long knife, and in the last a personage clad in fur holding a cup of wine. This latter one is surrounded by a Latin inscription: "Omnibus in membris designat imago decembris."

The third voussoir is composed of a rather heavy ornament of great decorative effect.

The church of Vézelay is one of the rare specimens of Romanesque architecture bequeathed to us by the great school of Cluny. The sculptures of the doorway, very remarkably executed, partake somewhat of the style of Byzantine art, but they are certainly not the work, as some are inclined to suppose, of Greek artists, brought to this country by the noble crusaders when returning from the first crusade. The tendency is Byzantine, but the execution Burgundian. The clever and naïve sculptors were undoubtedly our fellow countrymen; they took inspirations from paintings, enamels, and such like brought from Eastern countries, but they interpreted them, as it were, in their own manner, with their own "temperament," and this it is that gives to this work its great originality.

In short, the doorway of the Madeleine of Vézelay is one of the finest architectural pieces of the museum of the Trocadéro, which museum is destined to expose to public admiration specimens of our ancient national sculpture, our old French school of architecture, so fertile, so bold, and to which we owe so many precious monuments that hold an important rank in our artistic and national riches.

Paris. ADOLPHE GUILLON.

BEDSTONE COURT, SHROPSHIRE.

THIS mansion, built for the late Sir Henry W. Ripley, bart., stands about midway between the Hopton Heath and Bucknell Stations on the Swansea line of railway, on a knoll overlooking the valleys of the Clune and Terne, and forms a picturesque feature in the landscape viewed from the railway. It is approached by a new road through a deer park that has recently been formed, which road is entered from the main road, through ornamental gates of wrought-iron, flanked by a lodge in character with the mansion.

The house occupies three sides of a square, the entrance facing the east, the reception-rooms the south, the offices lying to the north.

The building is designed in the Early English half-timbered style, but to which has been imparted a Jacobean feeling. The brickwork is executed in red bricks from the Lilleshall Company, with quoins and dressings of Grimshill stone, and the roofs are covered with tiles, supplied by the Coalbrookdale Company.

Internally the treatment is Jacobean, and the reception-rooms are appropriately fitted up and elaborately decorated, whilst to all the apartments a special character has been given by a judicious introduction of such features as wooden chimney-pieces, moulded dadoes, panelled ceilings, and stained glass, the subjects chosen for the windows being suggested by the use of the respective rooms.

A reference to the plan (which will appear in our next issue) will sufficiently explain the arrangement and accommodation of the mansion.

The building was erected by Messrs. Cubitt & Co., of Gray's Inn-road, from the designs and under the superintendence of Mr. Thomas Harris, architect, of Gray's Inn-chambers, High Holborn, Mr. R. Old being his clerk of works. The internal fittings and much of the furniture was executed from the architect's designs by Messrs. Marsh, Jones, & Cribb, of Leeds, and the decoration and stained glass by Messrs. Campbell, Smith, & Campbell.

We will give another view, as well as the plan of the house, in our next.

SANITARY HOSPITAL, BOURNEMOUTH.

THIS sheet of drawings shows the general plan and arrangement of the Hospital, which was designed for the Bournemouth Commissioners by Mr. G. R. Andrews. The external walls are built hollow, with a space of 3 in., bonded with hoop iron to internal 4½ in. walls, which latter are built in cement. Boyle's air-pump ventilators are affixed to each ward on the centre of roofs for extraction, and Ellison's radiator ventilators in the external walls for inlet. Nothing is said as to warming the fresh air on admission.

REREDOS, MEAVY CHURCH, DEVON.

MR. J. D. SEDDING, ARCHITECT.

THIS reredos was erected in the Church of St. Peter and St. Paul in August last. The moulded framework is of a light greenish marble from the Yealmpton quarries. The panels are of alabaster, and the sculptured figures of white statuary. The work was executed by Mr. Seale, of Cold Harbour-lane, Brixton, from Mr. Sedding's designs.

ILLUSTRATIONS of a Villa at Wargrave-on-Thames, and of Old Houses at Boppard and Cochen, are unavoidably postponed.

BRITISH MUSEUM LECTURES.

MR. BOSCAWEN delivered, on Wednesday, the 10th, the second lecture of the present series in the British Museum. With a view to the accommodation of the especially large audience, the authorities had arranged one of the large rooms in the new wing of the building as a lecture-room. Mr. Boscawen commenced his lecture by pointing out that, as the decipherment of the inscriptions had shown that all the great linguistic languages were represented by tongues using the cuneiform writing as a means of expressing their thoughts, so the researches of explorers had shown that in the population of the land were found representatives of all the great ethnic families of the human race. The reason of this mixture of the population was to be sought in the position with regard to surrounding lands, and its attractive character to nomad wanderers. To the Akkadian coming from his pine-clad and snow-crowned mountains, as to the Shemite from the arid deserts of Arabia, it was alike a garden; and, indeed, as its own records call it, a land "flowing with milk and honey," whose streams are "the waters of fertility." The lecturer then proceeded to set forth the evidence which the monuments afforded as to the non-Semetic origin of the groundwork of Mesopotamian culture. The cities of Nimrod, he said, were but a few years ago mere names wafted hither and thither over the whole of Western Asia; but now the spade of the explorer had brought to light from beneath the grave-mounds of the Chaldean plains, the very bricks which formed the walls of the temples and palaces of the cities of Nimrod. Of the cities forming the tetrapolis, Mr. Boscawen said, Babylon was the only one whose site had never been lost, and Hebrew tradition and modern Arabic still located the site in the mounds of Babel. The explorations carried out by Mr. Rassam at Aboo Hubba had restored the ruins of the city of Akkad, and Mr. Loftus had partly explored the ruins of Erech, the Uruki of the inscriptions which lay buried beneath the mounds of Warka. The last of the cities to be identified was Calneh, and this had resulted from the explorations carried out by Mr. De Sarzec at Til-Lo on the Shat-el-Hie, a small stream joining the Tigris and Euphrates. There the explorer had found bricks and stones bearing inscriptions which revealed the city to have three names, Lagas, Sergulla, and Kulunu; the last of these was the origin of the Kalneh of Genesis. In concluding the account of the primitive city Mr. Boscawen proceeded to point out the important position of the temple. It was the germ, as it were, of the city from which and round which it grew up. In Chaldea, as in Egypt, the foundation of a city was the building of a temple of some king or great man. It was the residence of the patron city-protecting duty, and became, as it were, an embodiment of the city itself. It was the chief court of justice, the school, and civic record office and treasury. Some idea of the immense amount of secular business connected with temples in Babylonia was shown by the mass of inscriptions in the British Museum. From Warka, the ancient Erech, the capital of Isdhubar or Nimrod, Mr. Loftus had brought a series of legal, commercial, and social documents, dating as remote as the twenty-second century before the Christian era, and Mr. Rassam has found in the record chambers of the great temple of the Sun-god at Sippara the Sepharvaim of the Bible, over 30,000 inscribed fragments relating to almost every kind of commercial, legal, and fiscal transaction during the late Babylonian (B.C. 606-538), Persian, and Parthian empires. Mr. Boscawen next proceeded to treat of the arts and sciences of those ancient people. The discovery of a neatly-drawn plan of a temple upon a tablet, dating certainly as early as B.C. 2,500, had afforded a clue to the early origin of Babylonia mensuration. It was shown by a cubic rule, discovered with this plan, that the drawing was made to scale, and the proportional divisions of this scale had been accurately estimated by Mr. Flinders Petrie, the able Egyptian explorer and mathematician, and he found that they gave a cubit of $20\frac{3}{10}$ in. The divisions of this scale indicated that the ancient Chaldeans had made considerable progress in the knowledge of the theory and properties of numbers. Additional proof of this was afforded by the discovery of Mr. Loftus at Senkereh, the ancient Larsa, the Ellassar of Genesis xiv., of tablets inscribed with tables of square and cube roots from 1 to 60. The adoption of the sexagesimal scale was another evidence of the Non-Semetic origin of the inventors, and brought them in relationship with the Chinese. It was the use of the scale which enabled them to divide the great circles of heaven into 360°, and the year into 360 days. Mr. Boscawen then proceeded to describe the progress which these people had made in the arts, and his remarks were especially illustrated by the exhibition of some large drawings of the sculptures discovered by M. de Sarzec at Tel-lo. These statues, he said, were not moulded in plastic material or hewn out of soft stone, but were cut out of blocks of green diorite and porphyry, so hard as to turn the edge of the best-tempered chisels. The solution of the problem was not yet clear as to how the work was accomplished, but, judging by the analogy of Egypt, the work was carried out by the slow process of honeycombing with the diamond drill, and cutting away the perforated portion. The use of the diamond as a cutting-stone was proved by a bilingual list, and by such a slow process these great works had been carried out, and years, perhaps life-times, had been spent in their carving. Mr. Boscawen concluded his lecture by drawing a comparison between the two great civilisations of Egypt and Chaldea, and remarked that where, as in the former, priestly conservatism had exercised a fettering influence on literature and art, and stereotyped, as it were, the products of the father's mind, in the latter the nation had gone from step to step advancing along the path of progress until the influence of so rich a leaven was apparent far and wide.

The third lecture was delivered on Wednesday, the 17th, the subject being the "Shemites in Babylonia." The lecturer observed that the high position attained by the Chaldean civilisation and its far-spread influence was due to the progressive element of the Shemitic people in the population, who brought highly receptive, adaptive, and propagating faculties to bear upon the products of the Akkadian mind, and spread far and wide by the influence of war and trade the wisdom of Chaldea. The cuneiform inscriptions from the cities of Southern Chaldea threw threw great light upon the origin and position of the Shemitic element in the population. In the early contract tablets, dated in the reign of the Chaldean king Khammurabi, were found a series of early names which afforded important evidence. After referring to the connexion between these early inhabitants of Chaldea and the Hebrews and Arabs, the lecturer proceeded to deal with the question of the Abramic migration, its date and cause. In conclusion, he illustrated the social life of the people by translations from two legal tablets dating from the twenty-second century before the Christian era.

Mr. Boscawen's lecture on Wednesday, the 31st inst., will be on the "Sacred Books of Chaldea."

Omnibus and Tramway Men's Benevolent Society.—The cabmen have long had a society of this kind; the omnibus *employés*, who form in London a very large class, are starting a similar prudential institution, to create annuities for aged and totally disabled men, and to form a fund to assist the widows and orphans of men who are deceased members of the said fund. Mr. H. B. Verity is the secretary.

TAUNTON CASTLE.

The large hall, 58 ft. 6 in. by 24 ft., on the first floor, to the west of the entrance gateway, which contained the geological collection, has just been considerably altered and improved. Formerly its proportion was bad, as it was only about 10 ft. high, and the light was quite insufficient to show the specimens. Immediately above it came the roof, containing a number of attic bedrooms, the whole of the upper portion of this part of the castle (except the stair turret) having been much modernised. The wooden floor of the geological hall is about a foot above the top of the Norman vaulting to the rooms beneath, but restoration of the original level would be too costly at present; this must be deferred till a future time. The attic bedrooms have been swept away, a high-pitched roof with massive trusses having collars and king-posts put, the underside of the common rafters covered with boarding, and dormer windows (made to open) inserted. It is externally covered with tiles. The decayed plastering has been removed from the walls, and a considerable part of them rebuilt or faced with brickwork in cement, well tied in, and the rotten wood linings &c., of the windows removed. By the abolition of a modern fireplace at the north end of the hall, it has been possible to open out two thirteenth-century lancet windows, one of which had been nearly destroyed; these with their deep splayed reveals in the thick walls (5 ft. 6 in.) have an admirable effect. It may be mentioned that the side walls are also of great thickness. By the removal of incongruous useless fittings it has been also practicable to open out some Perpendicular windows on the east side of the hall. It is much to be regretted that the ugly sham battlements still remain, as well as the pseudo-Gothic windows in the west wall. Something less out of character with the ancient work is much to be desired, but must wait till the necessary funds are obtained. The works described have been done from the drawings of and under the superintendence of Mr. B. Edmund Ferrey, F.S.A., for the Somersetshire Archæological and Natural History Society, Mr. Charles Fox, of East Reach, Taunton, being the contractor.

ARCHITECTURAL SOCIETIES.

Birmingham Architectural Association.—The second ordinary meeting of the current session was held at Queen's College on Tuesday evening last, the Vice-President, Mr. W. H. Kendrick, in the chair. The following gentlemen were elected members of the Association:—Mr. F. J. Yates as an honorary member, and Messrs. W. G. Midgeley and G. Payton as ordinary members. Mr. J. King James gave a lecture on "Pediments and Gables," which was illustrated by photographs and by many of the author's own sketches. A discussion ensued, in which the following members took part:—Messrs. W. Doubleday, Franklin Cross, W. H. Kendrick, and Victor Scruton (hon. sec.). After a vote of thanks had been accorded to the lecturer, the meeting terminated.

Manchester Architectural Association. — An ordinary meeting of the Association was held at the old Town-hall, King-street, on the evening of Tuesday, December 9th, Mr. J. S. Hodgson in the chair. A paper was read by Mr. R. B. Preston, A.R.I.B.A., on "House Sanitation," in which attention was chiefly directed to the consideration of water and water supply. The various sources and methods by which water is usually obtained for the supply of our towns were enumerated, and its different chemical properties pointed out. The absorption of gases by water was shown to be a very important property in reference to sanitary inquiries, and one which should not be lost sight of in planning drains, as this fact might, under certain conditions, render all traps practically useless against the entry of sewer gas. The opinion of Dr. Frankland was quoted in reference to the contamination of water by organic matter, viz., that the danger resulting from the use of such water did not arise from the decomposition of organic matter, but from the risk lest some of it had escaped decomposition. In the discussion which followed, Mr. F. R. Hawxby mentioned a few of the inconveniences arising from the use of well-water obtained from the red sandstone, which contained a large proportion of lime and magnesia in solution. He proposed a vote of thanks to Mr. Preston for his paper, which was seconded by Mr. T. Chadwick, A.R.I.B.A. The meeting was also addressed by Messrs. Hodgson, Mould, Woodhouse, and Worthington.

Leeds and Yorkshire Architectural Society.—The members of this society and a large number of guests sat down to dinner at the Great Northern Hotel, Leeds, on Monday evening. Mr. E. Birchall presided, and the vice-chairmen were Mr. J. W. Connon and Mr. J. Demaine (York). The Chairman proposed "The Leeds and Yorkshire Architectural Society," which, he said, was in a very flourishing state. Mr. G. B. Bulmer (honorary secretary), in responding, said the society was endeavouring to cultivate and maintain a proper state of feeling between those who practised the same profession. Mr. J. W. Connon proposed "The Royal Institute of British Architects and Kindred Societies." He had the greatest possible faith, he said, in the value of the work which societies of this kind did in promoting good fellowship among their members, in raising the standard of the general morality of architects, and consequently in benefiting the public generally. It was not, and he hoped never would be, the aim of any of their architectural societies to promote simply their own interests. He was sorry to find that the architects of the country showed too great an apathy with regard to the assistance to be obtained from mutual combination, and that as a consequence there was a want of correspondence in architectural work in different parts of the country, a circumstance which brought about very serious disadvantages and very great inconveniences. They looked to Mr. Christian's year of office with hope and expectancy, as one likely to be fruitful in just and beneficial changes. Mr. Ewan Christian, President of the Royal Institute of British Architects, spoke in acknowledgment, and in doing so remarked there were no fewer than eighteen architectural bodies in the United Kingdom, besides others in the United States and elsewhere. When he entered the profession there was only one architectural society in existence. He agreed that these societies were of the greatest possible value in promoting union, not for selfish purposes, but for the study of art and for promoting uniformity of practice. He reminded them, however, that whilst societies were of great importance, each individual architect ought to consider that the honour of the profession at large was entrusted to his hands, because it was only from the action of individuals that the profession would be judged. Mr. J. Holden, President of the Manchester Society of Architects, Mr. W. H. Dunn, President of the Northern Architectural Association, and Mr. W. Jackson, President of the Leicestershire Society of Architects, also spoke in acknowledgment of the toast. The Rev. Dr. Gott proposed "Literature and Art." Mr. H. H. Statham and Mr. C. Pebody replied. Councillor Tweedale proposed "Law and Medicine," and Lieutenant-Colonel Hartley and Mr. A. W. M. Robson responded. Mr. John Hepper proposed "Commerce." Mr. J. Barran, jun., replied. The toast of "The Visitors" was proposed by Mr. Geo. Corson, and acknowledged by Professor Bodington, Principal of the Yorkshire College.

ROYAL ACADEMY STUDENTS' *SOIRÉE.*

The students of the Royal Academy held a *conversazione* in the Rooms of the Incorporated Society of British Artists, Suffolk-street, Pall-mall (by the kind permission of the Council and members of that Society), on Friday evening, December 12. The *conversazione* was attended by various members of the Academy,—amongst others, Sir Frederick Leighton, P.R.A.; Mr. J. C. Horsley, R.A., Treasurer; Mr. F. R. Pickersgill, R.A., Keeper; Mr. Yeames, R.A.; Mr. Armstead, R.A.; Mr. Dobson, R.A.; Mr. Burgess, A.R.A.; Mr. MacWhirter, A.R.A.; Mr. Brock, A.R.A.; Mr. Hamo Thorneycroft, A.R.A.; Mr. Frank Dicksee, A.R.A.; and Mr. Henry Le Jeune, A.R.A. The band of the Royal Artillery, with occasional solo and part-songs by the students, enlivened the evening, towards the conclusion of which Mr. Brandon Thomas and Mr. E. F. C. Clarke gave some of those recitations and piano performances often given at the *soirées* of the Hogarth Club, but, probably, for the first time heard by the lady students of the Academy. The *conversazione* was the first of its kind, and took the place of the usual students' supper. Its success was generally considered to be so satisfactory that it is to be hoped it may be given again in future years, if only to place the lady students on the same footing as their fellow-students of the other sex.

COMPETITIONS.

Manchester. — The Manchester Corporation have awarded the first premium to the design of Mr. Joshua Bury, of Manchester; and the second premium to the design prepared by Messrs. Massie & Mills, of Barnsley, in the competition for the proposed laying out of an open space at Cheetham as a recreation-ground.

Chelsea Vestry Hall. — The particulars for the guidance of competitors in designing plans for the additions to the Vestry-hall buildings, as settled by the Vestry on the 25th November, have been issued by the Vestry Clerk. The Vestry offer a premium of 100 guineas for the first, 50 guineas for the second, and 30 guineas for the third of such designs as shall, after taking the advice of a professional assessor, be selected, and all such selected designs shall become the property of the Vestry. Should the author, however, of either of the designs be employed as architect of the building, then the premium will not be given, but he will be paid a commission of 5*l.* per cent. on the cost of the work. If, in the opinion of the assessor, a design cannot be carried out within 10 per cent. of the amount named by the competitor, the latter will be disqualified from receiving any premium. The designs are to be sent in on or before Monday, the 23rd day of February, 1885.

LINE OF FRONTAGE CASE.

FULHAM DISTRICT BOARD OF WORKS *v.* COLLS.

This was an adjourned summons, heard before Mr. Sheil, the magistrate at Hammersmith Police Court, on the 16th inst.

The defendant, who is a builder and contractor, was engaged to erect a house and shop at the corner of King's-road and Parson's Green, Fulham. On the 5th of April, 1884, he gave the plaintiffs notice and deposited a plan of the proposed drainage. In due course he proceeded with the work, and the building was erected; he then called upon the plaintiffs to connect the house-drains with the main sewer: this the plaintiffs refused to do, alleging that the defendant had built in front of the general line of front of the adjoining houses, and until the question was settled, nothing could be done in the matter. The plaintiffs thereupon applied to Mr. Vulliamy (the Superintending Architect of the Metropolitan Board of Works), under the 75th Section of the Metropolis Management Amendment Act, 1862, to decide the general line of building in Parson's Green. Mr. Vulliamy gave his certificate on the 17th of November, 1884, defining the front wall of the adjoining buildings as the general line, and the defendant's building being 15 ft. in advance of that line. The plaintiffs applied for the magistrate's order to demolish the building so far as it projected in front of the general line as defined by Mr. Vulliamy.

The plaintiffs called several witnesses, but they were unable to speak definitely as to the buildings which existed upon the site before the erection of the structure complained of. On the other hand, the defendant called witnesses, who proved that the site was formerly occupied partially by a building, and partially by a paved yard, which was enclosed by a 14 in. brick wall 10 ft. in height, in which were window-openings enclosed by iron guard-bars.

Mr. Sheil decided that the owner had not relinquished his right to rebuild on the site occupied by the former building and yard, as decided in the cases of the Westminster District Board of Works *v.* Lord Auckland, and the Kensington Vestry *v.* Barlow, and dismissed the summons, with costs against the Fulham Board of Works.

Mr. Besley (instructed by Messrs. Watson, Sons, & Room) appeared for the plaintiffs, and Mr. Glen (instructed by Messrs. Marsland, Hewitt, & Everett) for the defendant.

Welford-on-Avon Church.—Archæologists have sustained a great loss in the destruction by fire on Saturday morning last, the 13th inst., of Welford-on-Avon Parish Church and tower. The bells had been rung on Friday night, and it is supposed that one of the ringers' candles set fire to the matting on the belfry floor, which lay mouldering through the night, and burst out into flame in the early morning. The tower is burned completely out, leaving only its massive walls standing, and five of the six bells are broken by falling on the floor below. The church is now a complete wreck. The seats and stalls, communion-table and pulpit, and other furniture, were saved.

BY-LAWS UNDER THE METROPOLITAN BUILDING ACT.

BUILDING ON DISUSED BURIAL-GROUNDS.
BLASHILL *v.* CHAMBERS.

THIS was an appeal (by way of special case) from the decision of Mr. Hannay, the magistrate sitting at the Worship-street Police-court on the 17th day of June last, on the complaint of Mr. Thomas Blashill, District Surveyor for Bethnal-green, complaining that the defendant, on the 30th day of March last, at Peel-grove, in the parish of Bethnal-green, did unlawfully commit breaches of the By-laws made by the Metropolitan Board of Works, under the provisions of 41 & 42 Vic., c. 32, s. 14, No. 1,—that is to say, by commencing to build on a site and foundations at the south-western corner of the Peel-grove Burial-ground, which had been filled up with materials impregnated with animal matter, to wit, some number unknown of dead human bodies without the said animal matter having first been properly removed. The second offence was for not pulling down the buildings erected by him on the said burial-ground, contrary to 41 & 42 Vic., c. 32, s. 17.

The facts of the case are as follow:—The defendant is a builder, and had commenced to build on the above ground, which had been closed by an Order in Council in the year 1855, when it was estimated that some 20,000 people had been interred therein. The depth of the graves was in some cases 20 ft., and in other cases 25 ft., and the coffins were piled up to within 2 ft. or 3 ft. from the surface. After the closing of the ground rubbish was deposited thereon, forming a bed varying from 1 ft. to 4 ft. in thickness.

The builder, having commenced to put in concrete foundations, the complaints were laid, and upon the hearing, Mr. Hannay dismissed the complaints, on the ground that the meaning of the words "site and foundation" in the By-law could not be extended beyond that given by the Act 41 & 42 Vic., c. 32, s. 14, and that the foundation and site had been properly prepared, and that the By-law was not applicable to the present case.

The District Surveyor appealed against this decision, and the case was heard in the Court of Appeal last week, before Mr. Justice Grove and Mr. Justice Hawkins.

Sir H. Giffard, Q.C., and Mr. Besley, instructed by Mr. Thomas Burton, appeared for Mr. Blashill; and Mr. Gainsford Bruce, Q.C., and Mr. Graham for the builder.

After hearing the arguments of counsel, the Court decided to dismiss the appeal with costs, on the ground that the Act and By-law could not be applied to the case of a burial-ground.

WIDE TENDERING.

SIR,—Ten years since the Cottage Hospital was erected here. Shortly after the completion of the building, the walls began to settle and crack. This has gone on increasing, and it was deemed desirable to examine the foundations, which were found lamentably defective, concrete being almost entirely absent where it ought to have been present, and, where it exists, of very inferior quality. It has been decided, under advice, to underpin the walls, and insert damp-proof course beneath the inner walls. I beg to send you the prices given by the four persons who tendered for the work, asking if you can reconcile the great discrepancy therein.

A MEMBER OF THE COMMITTEE.

Beccles.

*** The following is the list of tenders enclosed; but "reconcilement" of such discrepancies is as much beyond our insight as it is fortunately out of our province:—

"For underpinning the outer walls of the Beccles Cottage Hospital, and inserting damp-proof course beneath the inner walls:—

Everal, Malvern	£225	0	0
Hopson, Beccles	168	10	0
Bennett, Norwich	97	15	0
Calver, Ringfield (accepted)	52	0	0"

SCULPTURE, BLACKFRIARS BRIDGE.

SIR,—I wonder your correspondent, Mr. Frith [p. 808, *ante*], should not know why none of the premiated competitors in the first abortive competition were not asked to compete further.

Those eminent referees, to whose decision the Corporation remitted the matter, duly adjudicated the 1,000*l.* in premiums according to comparative merit, but they also reported as follows:—"That they were not prepared, in view of the great importance of the work and the high gifts required for its adequate performance, and in view also of the calamitous results of failure, to recommend the execution of any of the designs submitted to them, or the employment of the competing artists in the preparation of other designs with a view to their execution." The report itself may be seen at the Guildhall.

The Corporation gave away the 1,000*l.* without obtaining any benefit, and they followed the advice of those to whose judgment they referred,—namely, Sir F. Leighton, Mr. Calder Marshall, and Mr. G. F. Watts. They are to be commended for so acting.

That the competition was abortive is no reflection on the general body of sculptors. But that is now an old story: and I am sorry to add that the matter is not yet put on a footing which, in my opinion, can lead to a satisfactory result.

With regard to Mr. Cave Thomas's suggestion that an association of sculptors should be inaugurated, I heartily concur. I doubt a little whether these artists as yet see the importance of this, and are prepared to set aside jealousies and pull together for the general good; but though not a sculptor, I would gladly assist if I could, to see this done. In an instance like the present the want of some representative to speak with authority becomes painfully evident. JAMES EDMESTON.

NEW ROUTES.

SIR,—By the *Builder* of Dec. 13 [p. 789], it seems at last settled to have a new road made from Gray's Inn-road to St. John's-street-road to improve the route to the north; but there is also a route, I believe, more directly north, *i.e.*, by Gray's Inn-road and Caledonian-road, if it were not for a very awkward block of buildings which intercepts the junction of Gray's Inn-road with Caledonian-road, and which block induces drivers of vehicles wanting to get into the one from the other of the roads to take a tortuous journey down bye-streets. It seems to me that for a very moderate sum the booking-offices at King's-cross might be readily removed, and a bridge thrown across the railway line, making a proper junction of the two roads. Possibly a little discussion in the *Builder* might lead to the much-required alteration being carried out.

H. E. BALL.

P.S.—I believe it would save omnibuses, &c., travelling from Holloway to Holborn, or *vice versâ*, fifteen to twenty minutes' time.

FIRE-BARS.

SIR,—We have an ordinary kitchener, in which the top fire-bar every two or three weeks completely doubles up (formerly they used to last three months), and constantly has to be replaced by a new one. Will you, or any of your numerous correspondents, be kind enough to tell me if there are any means of averting the above?

AN OLD SUBSCRIBER.

WATER STORAGE.

SIR,—I have read with interest the articles that have appeared lately in the *Builder* advocating water storage. In your issue for the 30th of August last [p. 284], you advise a slate tank or some other material. I think the following plan would be far cheaper (and cost is often a great consideration) and trustworthy. Where the soil is suitable, excavate a circular well, the diameter and depth according to circumstances; coat the surface with two of sand to one of cement; the next coat half and half, and the last coat finished in neat cement; turn an arch over, and leave a manhole, and then you would have a tank that would hold thousands of gallons, as sound as a china basin, and much cheaper than any other method. It is as well to get water into it as soon as possible after it is finished. E. P.

PROVINCIAL NEWS.

Haverhill (Suffolk).—We learn that a scheme, prepared by Messrs. Smith & Austin, C.E., for disposing of the sewage of the town of Haverhill, and removing the difficulties at present obtaining with certain riparian owners, has been adopted by the Local Board.

Liverpool.—A temporary home for lost and starving dogs has been erected within the grounds of the Liverpool Zoological Gardens Company. The kennels,—eight in number,—form a semi-circle. They are built of red sandstone, and roofed with red tiles. Each kennel, which will comfortably hold from a dozen to sixteen dogs, has a spacious area in front of it, with a concrete flooring. The internal arrangements of the kennels are well suited to the purpose for which they are designed. The floors, like those of the yards, are formed of concrete, and the beds are raised a few inches above them. These beds are composed of soft thin shavings, which are considered the best material both from a health and warmth point of view. A sliding board keeps the beds from being scattered about the floor, and can be readily lifted up and the whole of the shavings removed when it is needful to renew them with a fresh supply. In the wall of each of these "dormitories" is an iron ventilator which can be opened or closed at will, and which gives the needful supply of fresh air when it is necessary to keep the doors closed. There is an aperture, which can also be closed when required, in each of the doors, which enables the canine inmates to frisk in and out without having the larger door open. Messrs. Sugden, of Leek were the architects.

Exeter.—On the 4th inst. the additions to Mr. Harry Hems's business premises in Longbrook-street, Exeter, were opened. They have been erected from plans by Mr. R. Medley-Fulford.

The Student's Column.

A SECOND PERSPECTIVE LESSON.

IN a previous article (p. 443, *ante*) the first principles of drawing in perspective were illustrated by the appearance of a small object, a match-box, as seen through and drawn upon a sheet of glass employed as a picture plane.

The chief use, however, of perspective to an architect is to ascertain what his buildings will look like while, as yet, they only exist on paper.

These buildings are, of course, drawn much smaller than their actual size (fig. 1), and, so far, they differ from the match-box, which was itself supposed to be laid down on the sheet of paper and its appearance drawn on the glass.

The only corresponding difference to be observed is that the spectator must suppose himself to be reduced to the same scale as his design, and that his Liliputian eye is,—let us say,—$\frac{3}{8}$ in. above the sheet of paper representing the ground level, supposing his design to be drawn to $\frac{1}{16}$ in. scale.

He will now have the kindness to place his reduced self at the *station point* (S. P.) (fig. 2), and, looking straight before him, to mark on the sheet of paper from his feet two lines, embracing an angle of 30° (15° on each side), which will give him the extreme *visual rays* of the perspective.

He will then use his judgment, in accordance with the principles laid down in the former article, as to the *size* that he prefers for his perspective view, by fixing the relative positions to his eye (S. P.), the *picture plane* and the *object*.

He will, moreover, turn his plan about until he is satisfied that the various features, such as the gables and chimneys, form the best possible grouping, avoiding, of course, any impossible view of his intended building.

Should his building be intended for a narrow street, he will embrace a slightly wider angle of vision than 30°, otherwise he will find that his view only takes in a portion of his building.

He will also find in the result that buildings have to be specially designed to look well in narrow streets, and that the pleasing outline of a distant homestead is "nowhere" in a town; while a slice out of a Chester row would be equally unhappy-looking if perched on a hill-slope in the country.

Moreover, an elevated or depressed position must be equally calculated for, and this question, of course, determines the level of the eye and of the *horizontal line*.

In some cases it is desirable for the designer to "wish he were a bird," so as to obtain an idea of a large group of buildings as seen in a bird's-eye view. This may seem a complicated proceeding, but the writer has hit upon a very simple method of treating it, which may be illustrated, if asked for, in a future article.

Having now settled the relative positions of eye, picture, plane, and object, he has simply to proceed as before described, with this difference,—that, instead of handling a match-box, he will handle a pair of dividers, and will measure with them the various heights from the elevations that he has prepared, and transfer these to their respective lines of height.

It is often desirable to make the picture plane *touch* one angle of the plan of the building, and thus save the trouble of bringing lines forward merely to carry them back again.

On the other hand, it is false economy of trouble to work too much off one line of heights by carrying lines around the building.

On the diagram (fig. 2), the left-hand side of the plan, A B, has been brought forward to the picture plane at L H. It has then been carried back to that angle, and thence returned across the face of the gable from the left-hand *vanishing point*. A separate line of heights, found from this vanishing point, has been used for the side wall of the right-hand gable, C D.

In finding this left-hand vanishing point, according to the rules laid down, it will be found to be a long way off,—measuring always

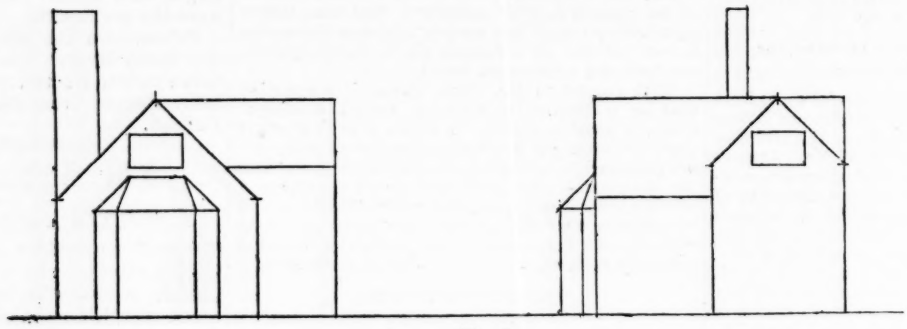


Fig. 1.

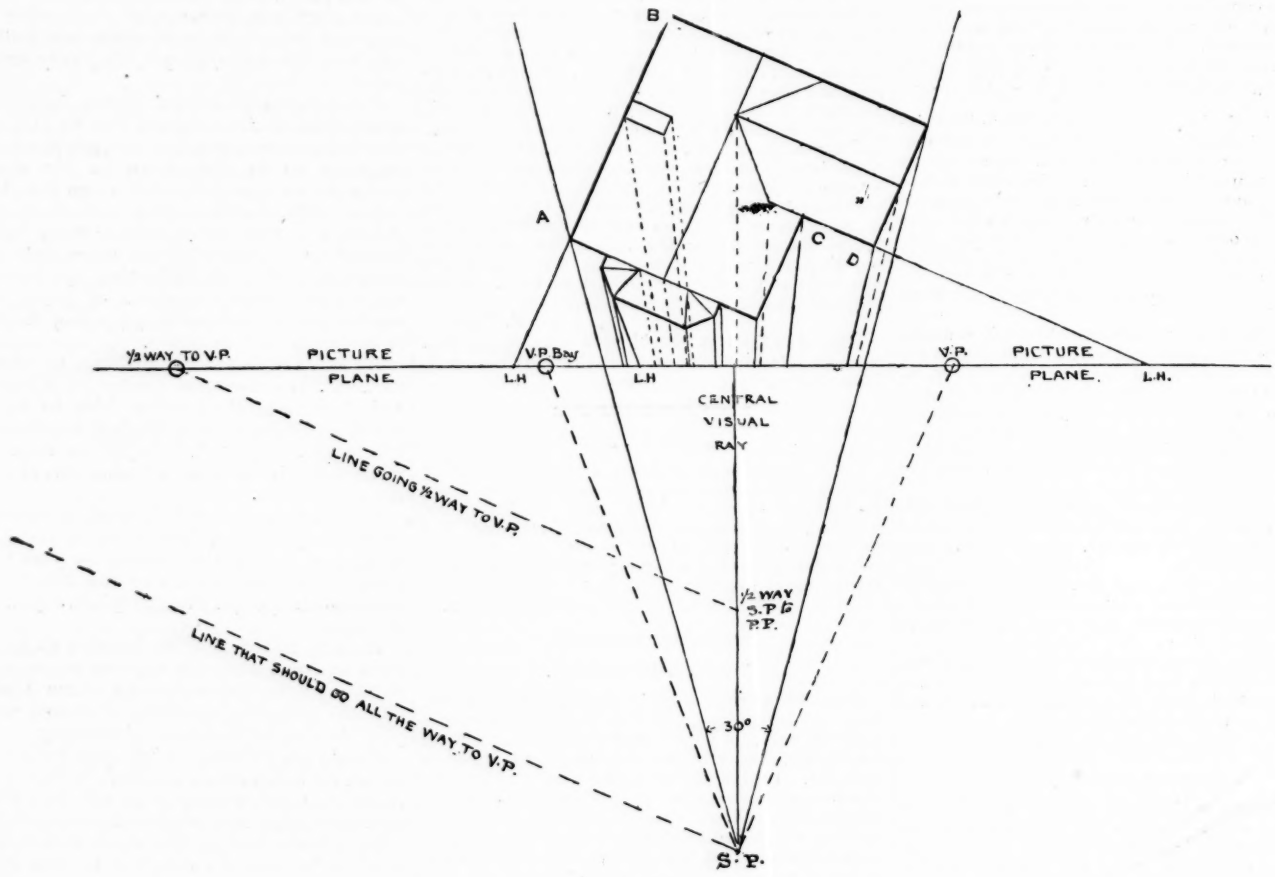


Fig. 2.

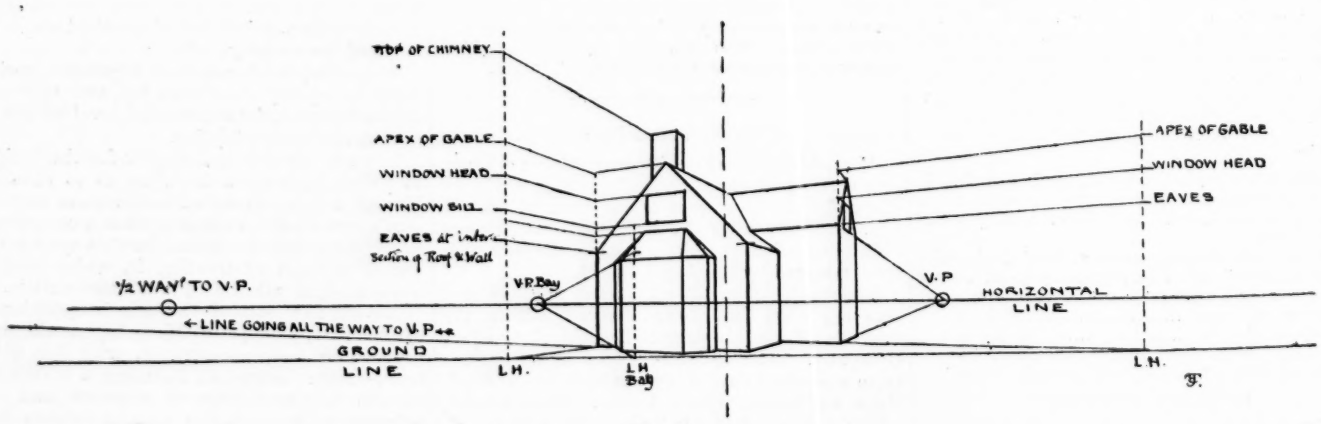


Fig. 3.

from the central visual ray. It might be a process involving severe gymnastic exercises on the part of the draughtsman, and is simplified by dividing the distance between the station point and the picture plane into any convenient number,—on the diagram it is divided into two.

Any one conversant with Euclid will see that a point will be found at half the required distance along the picture plane, which half distance has simply to be doubled on the horizontal line in order to find the real vanishing point.

The great thing in perspective drawing is accuracy, and the avoidance of confusion.

Plans of the building at *various heights* have to be laid down, and corresponding visual rays drawn from them. On the diagram, the roof plan is distinguished by *thin lines*, and the visual rays therefrom are *dotted*.

In practice, it is better to use different *colours* for the various planes and their rays, and, instead of crowding the picture plane with rays (many of which will overlie each other), to use separate slips of paper pinned down against the picture plane, taking care to mark on each the central visual ray first of all.

Before committing himself too far, the draughtsman should get the general block of the building into perspective to make sure of its grouping well.

Finally, if it be asked whether the view will be the same as would be seen by a man of ordinary stature, without the necessity of shrivelling himself down to one-eighth scale, or one-ninety-sixth of his actual size, the answer is, Yes; and that he has only to follow out the directions given in the previous article in order to prove this. That is to say, if the house were actually built, and he wished to make a sketch of it to the size here described, he would have to *retire from it* so as to increase the distance between the object (the house) and the picture plane (his sketch-book), until the latter, held at arm's length, contains the appearance of the house to the required size.

All the other processes then fall into their places, but, instead of being set out to one sixteenth-inch scale, they are found at their actual distances on the picture plane, and present no special difficulties as regards the vanishing points. The lines of heights would, of course, be impracticable, as they imply a sheet of paper as high as the house, but, with a little ingenuity, even this part of the rules could be applied to the process.

CHURCH BUILDING NEWS.

Holloway.—On Saturday last, the 13th inst., the new Church of Emanuel, Hornsey-road, Holloway, was consecrated by the Bishop of London. The church is seated partly with benches and partly with chairs, and holds nearly 1,000 persons. On plan the building consists of nave and chancel, north and south aisles, baptistery, and vestries for clergy and choir. The style of architecture adopted is First Pointed, carried out almost entirely in red brick, no stone being used externally, except for the ornamental niche on the entrance elevation, which is executed in red Corsehill stone. Internally, Bath stone is employed for shafts, caps, bases, corbels, and the chancel arch; the remaining arches, labels, and string courses being entirely of moulded red bricks, made to the architects' full-size details by Mr. James Brown. The works have been carried out by the builders, Messrs. Taylor & Grist, of Aylesbury, from the designs of the joint-architects, Mr. Frederic R. Farrow and Mr. E. Swinfen Harris, F.R.I.B.A., of 32, Craven-street, Strand, W.C. The whole of the footways of the church are laid with mosaic by Messrs. Diespeker & Co. Especial care has been bestowed by the architects upon the design of the wrought-iron hinges, finials, railings, and gas-fittings, which have been executed by Mr. W. R. Shrivell and Mr. W. Downing. The heating is effected by high-pressure hot-water pipes supplied by Mr. R. Renton Gibbs, and a system of ventilation has been devised by the architects based upon the natural means of temperature-difference, and assisted by one of Boyle's extractors. We are informed that the acoustic arrangements of the church are based upon some recent investigations in a new direction by Mr. F. R. Farrow, and they are stated to be very successful.

Esher.—The monument erected in Esher Church to the memory of the late Duke of Albany is of choice selected alabaster, richly and delicately carved. It was designed by Mr. Blomfield, and has been executed by Messrs. Earp, Son, & Hobbs, the marble bust being the work of Mr. Williamson, of Esher.

Bromley (Kent).—Bromley Church has just been enlarged by the addition of a new chancel, south chancel aisle, and a vestry with an organ chamber above it on the north side, from the designs of Mr. T. G. Jackson, architect, at an expense of nearly 4,000*l.* Of the mediæval church at Bromley there are but few remains. During the last two centuries there appear to have been at least three tolerably complete remodellings of the building. In the last century it seems to have been either rebuilt in red brick, or so remodelled in that material as to have retained but few features of the mediæval building. About fifty-two years ago the body of the church seems to have been again practically rebuilt, and about ten years ago it was reseated, the galleries were new fronted if not reconstructed, and other alterations took place. Fortunately, the fine old fifteenth-century tower has survived these three successive attacks, which have proved fatal to the body of the church. Of the mediæval building nothing else now remains but the Purbeck bowl of the font (which, from the analogy of that at Merstham in Surrey, appears to be a work of the end of the twelfth century), a fragment of a fourteenth-century oak door, and a very interesting but incomplete arched recess, which, after being removed from the north wall of the old chancel to the south side of the vestry, was fixed in the east wall of the church, and has now been placed in the north side of the new chancel, where it serves as a credence. This dates from the latter part of the thirteenth century. The west wall of the fifteenth-century nave also remains, with the ruins of a late three-light flat arched window, and it is possible that the fabric of the south wall of the church may be old, though all the windows and doors are quite modern. With these exceptions, and that of some monuments, the church contained absolutely nothing of the slightest architectural or antiquarian interest. The fabric of 1829, so far as concerns the arcade and galleries, is so slight as to convey the impression of insecurity, the slender columns themselves being still further reduced in substance by having the back member cut away to leave room for the introduction of an iron prop to the gallery, which forms in appearance part of the clustered shaft. Nothing can well be worse, either in construction or in design, and there can be little doubt that before many years the parish will find itself called upon to replace the interior work of the nave by a more substantial structure. The new work is of brick, faced with flints and dressings of Doulting stone externally, and all the internal architectural features are in white chalk. All the old monuments have been carefully preserved and refixed chiefly in the new building, to which they add an historic interest and a picturesqueness often absent from new churches. The builder was Mr. Balding, of Bromley, and the clerk of works Mr. Bentley. The heating is by Messrs. Haden & Sons, and the carving by Messrs. Farmer & Brindley.

St. Leonard's-on Sea.—Christ Church, built in 1875 from the designs of Mr. A. W. Blomfield, has now been consecrated, a special interest attaching to the occasion being the erection of the new pulpit of elaborate design by Mr. Blomfield. The lower portion is hexagonal, supported by marble columns, and the upper parts circular, divided into five arches, each containing the sculptures respectively of Noah preaching (the Ark building in the background), the preaching of John the Baptist, the Sermon on the Mount, St. Peter preaching at Mars Hill, and St. Paul preaching at Athens. These are executed in white alabaster, the arches and crocketted buttresses dividing them, as also the pulpit, generally being of yellow Mansfield limestone. The work has been done by Messrs. Earp, Son, & Hobbs, of London and Manchester, who also executed the carving throughout the church at the time of its erection.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

3,036, Improved Chimney Pot. T. Anwyl.

For the cure of smoky chimneys a chimney-pot, with louvres, is here devised. The top of the chimney-pot is closed, and inside the louvre portion vertical partitions are placed at right angles, so that whichever way the wind is blowing there is always free egress for the smoke. Any direct currents of air which may strike against the pot will first strike on the louvres, and if they enter the pot will be forced to take an upward direction, and will strike against the partitions, and be deflected back through the louvres. The closed top assists this outward course of any currents of air which enter the pot, and prevents the wind blowing directly down the chimney. When the wind blows on one side of the partitions, the chambers or flues on the opposite side will be free for the egress of smoke, which to a certain extent will be drawn or sucked out by the laterally deflected currents of air.

2,847, Improved Imitation Marble. A. Guattari.

Gypsum articles or carved or sculptured objects are immersed for some length of time in a hot preparation of bitumen. During this operation the dehydration of the material is accomplished, and the bitumen not only penetrates the mass, but fills all the pores and spaces left by the water which was contained in the material treated. A hard and compact mass, which takes a brilliant black polish, is formed. Gypsum is also treated in the rough mass, and pulverised gypsum or marmorite may be similarly impregnated with bitumen.

2,404, Improved Cowls. G. F. Harrington.

This improved arrangement of cowls for ventilating purposes is an extension of an idea patented by the same applicant, where cowls are applied to the ventilation of sewers. In the adaptation, self-revolving cowls, trapped, with upcast shafts, on which they revolve, are used, and the shafts are made with wickerwork, lined inside, and coated outside with cement or brick tiles. The shafts are arranged to ventilate and convey fresh air to the sewers. A similar arrangement is by this patent adapted for rooms of public and private buildings, ships, and other places requiring ventilation. The cowls are formed swan necked in shape, to combine the acting and re-acting force of the wind. The cowls are trapped at their connexion with the shafts by means of oil in a suitable receptacle. The shafts are easily affixed to dwellings, and, from the greater size which this form of construction allows, much greater volume of fresh air is allowed to enter the hall, apartment, or cabin to be ventilated.

2,578, Ventilating Ridge Tiles. S. Turner.

A ridge tile is made with passages for ventilation under the eave or ridge of the tile.

3,274, Water-closets. S. A. Adams.

Refers to flushing out the trap of a water-closet. To effect this a branch pipe is connected from the supply to the basin, so that the trap is flushed out every time water is admitted to the basin.

3,739, Oil-cans. J. Lucas.

In the description of oil-cans where oil is ejected by collapsible sides, the shape of the sides is preserved by inserting in the body of the can a spiral spring.

APPLICATIONS FOR LETTERS PATENT.

Dec. 5.—15,978, R. Cotterell, Decorative Surfaces.—15,984, J. Jenkins, Fire-grates, &c.—15,999, A. Gratly and L. Madack, Apparatus for Preventing the Slamming of Doors.—16,000, H. J. Alaison, Manufacture of Artificial Stone. — 16,023, T. Durrans, Traps for Sinks, Basins, &c.

Dec. 6.—16,041, J. Gowans, Improvements in Cisterns.—16,057, J. Rhodes, Cupboard Door Turns.—16,066, C. Clarke and A. E. Parsons, Improvements in Sash Fasteners.—16,068, B. Turner, Door Springs.—16,075, J. B. Petter, Improvements in Chimney Tops.

Dec. 8.—16,097, J. W. Saunders, D. T. Davies, and J. A. Macdonald, Improvements in Sash Fasteners.—16,114, E. Wretzner, Improvements in Brick Presses.—16,134, G. E. Eachus and P. A. Maignen, Ventilating Sewers, &c.

Dec. 9.—16,145, E. W. Astle, Heating Buildings.—16,154, J. Ball, J. H. Rawson, and F. R. Rawson, Manufacture of Chisels, Gouges, and Augers.—16,163, J. H. R. Dinsmore, Band-saw Machines.—16,164, J. Brown and T. A. Porter, Apparatus for Climbing Chimneys.—16,167, A. C. Billings and A. D. Middleton, Water-closet Basins.—16,177, F. Mankey, Ornamental Woodwork and Process of Producing same.—16,187, G. F. Williams and W. C. Horne, Luminous Letters and Signs.

Dec. 10.—16,209, C. L. Baker, Elastic Driving Band.—16,214, T. G. Dooning, Open Fireplaces for Heating and Ventilating Apartments.—16,222, F. McIlvenna, Standards for Shop Windows.—16,223, G. C. A. Krigg, Fixing Iron Rain-water and Soil Pipes.—16,239, J. Robbins, Manufacture of Cements or Compositions.—16,251, E. Brady, Substitute for Wood, Iron, or Stone.—16,255, A. H. Cowles, Machinery for Excavating Earth. — 16,258, H. Wainwright, Supplying Water to Water-closets, &c.

Dec. 11.—16,278, R. H. Griffin, Securing Wood against Bench Stop while being Worked or Planed.—16,283, E. Verity, J. M. Verity, and B. Banks, Apparatus for Opening, Closing, Staying, or Securing Windows, Skylights, Ventilators, &c.—16,290, T. Jones, Supporting the Roofs of Buildings.—16,311, E. E. Searle, Decorating Glass.

PROVISIONAL SPECIFICATIONS ACCEPTED.

5,396, T. Thornton, Flooring Cramps.—8,124, G. J. C. Marie, Cleansing the Outside of Buildings, &c.—13,713, E. Preston, Improvements in Planes, Spokeshaves, &c.—13,824, E. Grach, Manufacture of Mosaic Ornamental Designs or Patterns.—14,310, F. Candy, Manufacture of Bricks, Architectural Blocks, and Enamelled Ornaments used in Building Construction.—14,319, E. G. Balner, Ventilating Apparatus.—14,614, W. Corteen, Opening and Closing Windows.—14,896, T. B. Walter, Flushing Apparatus for Water-closets.—15,255, A. K. P. Gerlach and H. M. C. Unger, Kitcheners.—15,503, J. M. Bryden, Automatic Sash Fastener and Lifter.—1,588, J. Hummerston, Locking Catch for Bolts, Window Fasteners, &c.—14,917, R. A. Stoffert, Improvements in Girders.—15,464, J. G. Lorrain, Ventilation.—15,665, J. J. C. Davis, Wood Pavements.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to opposition for two months.

942, R. Wadsworth and S. Wadsworth, Tipping Wagons and Carts.—3,093, G. R. Crow and W. H. Crow, Planing, Shaping, and Slotting Machine.—3,214, F. W. Hagen, Waste and Soil Pipes.—3,461, W. A. Carlyle, Metal Rollers for Wall-paper Printing.—4,866, A. G. Garrood, Ventilating Sash Fastener.—14,482, J. Peirce, Wood-planing Machine.—1,520, B. Haigh, Water-waste Preventers.—2,777, W. Monnery, Improvements in Wall Ties.—3,994, G. Dilliway and E. Newman, Furnaces for Bakers' Ovens.—3,927, W. Hayhurst, Holdfasts for Carpenters, Joiners, Cabinetmakers, Wheelwrights, &c.—3,945, E. Robinson, Ventilating Rooms, Passages, and Buildings.—4,047, C. Lawrence, Smoke Extractors or Ventilators.—10,221, R. Mason, Window Frames and Sashes.—10,301, G. Skudder, Supplying Disinfectants to Water-closets, Drains, &c.—10,434, G. H. Brown and A. Brown, Domestic Fireplaces.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

DECEMBER 11.

By HARDS, VAUGHAN, & JENKINSON.

Rotherhithe—36, Derrick-street, freehold	£235
Lewisham—9, St. Stephen's-road, 78 years, ground-rent 5*l.*	260
New-cross—19 and 21, Vance-street, 83 years, ground-rent 6*l.* 6s.	320

DECEMBER 12.

By FRANK LEWIS & CO.

Stoke Newington—3, Shacklewell-lane, 88 years, ground-rent 6*l.* 10s.	410

By W. B. HALLETT.

Tottenham—22, Lordship-lane, freehold	610
The reversion to one-sixth share of railway stocks valued at 8,000*l.*, life aged 54	450

DECEMBER 15.

By EDWARD MILLARD.

Holloway—George's-road, ground-rent of 13*l.*, reversion in 88 years	280
Wellington-avenue—Ground-rents of 32*l.* 10s., part freehold and part leasehold	700
Grove-street—Ground-rents of 32*l.* 10s., ditto	700
Surrey, Kent, and Herts—Rent charges of 6*l.* a year	102

By Collier & Bowditch.
Greenwich—Bridge-street, the Beehive Public-house and house adjoining, freehold £1,550
Croydon—23, Union-street, freehold..... 80
Canterbury—Dane John Farm and 5a. 1r. 21p. freehold 1,520

By Horace Dove.
Enfield—1 and 2, Gladstone-villas, freehold..... 945

By Wagstaff & Warman.
Barnsbury—14, Edward-street, freehold 275
Kingsland—16-32, even, Ormsby-street, 7 years, ground-rent 25*l.* 12s..... 470

By Crispin, Moore, & Hollebone.
Gower-street, W.C.—No. 99, freehold 2,100

By F. J. Bisley.
Walworth—37, Dean's-buildings, 80 years, ground-rent 6*l.* 10s..... 420
Rotherhithe—3, Princes-street, freehold 305
63 and 65, Hawkstone-road, 66 years, ground-rent 6*l.* 450

December 16.

By A. Booth.
Haverstock Hill—53, Adelaide-road, 62 years, ground-rent 3*l.* 10s. 670
Kentish Town—11, Bartholomew-villas, 77 years, ground-rent 7*l.* 600
62, Carlton-road, 66 years, ground-rent 6*l.* 6s..... 360

By W. H. Moore.
Hampstead-road—13, Little Exmouth-street, 26 years, ground-rent 8*l.* 8s. 700

By Rogers, Chapman, & Thomas.
Pimlico—16, Winchester-street, 47 years, ground-rent 10*l.* 650
South Belgravia—44, Bessborough-street, 49 years, ground-rent 11*l.* 680

By Ward & Clarke.
Lewisham—49, 50, and 51, Thurston-road, 78 years, ground-rent 7*l.* 10s. 585
South Norwood—A plot of freehold land 95

By Reynolds & Eason.
Clerkenwell—Elm-street, the City of Lichfield public-house, and property adjoining, freehold, area, 6,000 ft. 2,070
Dulwich—Melford House, Melford-road, freehold... 375
Bow—31 and 32, Tredegar square, 18 years, ground-rent 22*l.* 320

December 17.

By Norman & Son.
Whitechapel—87, High-street, freehold..... 3,550

December 18.

By Thurgood & Martin.
Notting-hill—Nos. 41 and 43, High-street, and 1, 2, and 3, Silver-street, copyhold 7,450

By Prickett, Venables, & Co.
South Mimms—A plot of freehold land, 1a. 1r. 9p. . 180

By Newbon & Harding.
Tottenham-court-road—17, Tottenham-street, copyhold 450
Islington—62 and 64, Queensbury-street, 26 years, no ground-rend..... 460
24-38, even, Coleman-street, 43 years, ground-rent 50*l.* 8s..... 2,465
Streatham—Leigham Valley-road, four plots of freehold land..... 280
Stoke Newington—51, Wellington-road, 26 years, ground-rent 1*l.* 5s. 210

By T. G. Wharton & Sherrin.
Clapton—Pond-lane, ground-rent of 56*l.*, reversion in 98 years..... 1,350
Pond-lane, a plot of freehold land 400

By Herring, Son, & Daw.
Lower Tulse-hill—No. 112, term 55 years, ground-rent 13*l.* 775
Upper Tulse-hill—No. 120, term 55 years, ground-rent 17*l.* 10s..... 720
Nos. 138 and 142, term 56 years, ground-rent 34*l.* 1,710

By G. A. Wilkinson.
625 "A" Seven per cent. Shares of 20*l.* each in the Brighton and Hove General Gas Company 16,576

MEETINGS.

Monday, December 22.
Inventors' Institute.—8 p.m.

Tuesday, December 23.
Institution of Civil Engineers.—Annual meeting. 8 p.m.

Saturday, December 27.
Royal Institution.—Professor Tyndall on "The Sources of Electricity."

Miscellanea.

Hand-Guide to Southwell Cathedral.—A penny guide-book to the grand church which now ranks as a cathedral has been brought out by Miss Glaister, of Southwell, whose name is favourably known in connexion both with decorative art (as the authoress of the book on "Art Needlework," in Macmillan's series), and with literature in the wider sense. The "Hand-Guide to Southwell Cathedral" makes no attempt at literary form, however, but simply gives, in the briefest manner, information which appears to be correct upon the date and history, and various portions of the building. A word more of explanation for the uninitiated visitor might have been as well here and there. For instance, Miss Glaister Anglicises "quadripartite" into "four-part" vaulting, but the shorter term probably conveys no more information to a casual visitor. For the same reason it would have been as well, in mentioning the panelling of the north door "carved out of the solid," to remark how very unusual a proceeding this is. These points may be attended to in a second edition, perhaps.

A Memorial of Dr. Johnson.—Some years ago a good old house was pulled down in the Old-square, Birmingham, in forming the new street called Corporation-street. In that house the great doctor lived for some time, when a young man, with his old school-fellow, Edmund Hector, who practised there as a surgeon for many years. The house had been already marked by a memorial tablet, put up with the owner's leave, by the members of "Our Shakspeare Club of Birmingham," in 1865. When the house was pulled down, in order to preserve the commemoration of Dr. Johnson, the wainscoting and appointments of one particular room were removed and presented by the Improvement Committee to the Archæological Section of the Midland Institute. These have been conveyed to Aston Hall, and one room on the ground-floor has been fitted up with them under the direction of Mr. J. A. Cossins, architect, in which have been placed the memorial-stone taken from the front of the old house, and one portrait of Johnson and another of Hector. Saturday last being the centenary of Johnson's death, the ceremony was gone through of presenting these memorials to the Mayor of Birmingham, who received them on behalf of the town.

Proposed Public Improvement in Lambeth.—At a recent meeting of the Lambeth Vestry Mr. George Hill called attention to the bad state of the enclosed piece of ground in Palace-road, belonging to St. Thomas's Hospital, and moved that a deputation should be appointed to wait upon the Treasurer of the Hospital with the object of having the nuisance abated or abolished, and also to ascertain upon what terms the Governors would be prepared to surrender the land to the parish to be preserved as an open space. He said that the space at present only seemed to afford a hoarding for advertisements. The space was 3,000 superficial feet in extent, and, in proportion to the whole of their site, had cost the hospital authorities 5,000*l.* There had been applications to build on the land, but the parties had not been able to come to terms. It would be a great improvement if the land could be secured and maintained as an open space. The motion was seconded by Mr. Schmidt, and a deputation of six members, including the rector, was appointed to wait upon the hospital authorities.

Stanhope Patent Water Purifier.—This is an automatic purifier, the main value of which, if it carries out its professions, will probably be in preparing hard water for more effective use in washing processes, and for use in boilers without incrustation. The patentees go further, and state that by its means refuse water from factories, &c., can be purified before passing into streams. That is a much larger matter, and we must know something about the principle and method of action before expressing any opinion on its possible usefulness in that manner. The circular sent to us gives not the slightest information on this head.

The Ventnor Local Board, at a meeting held on the 15th inst., resolved to give their surveyor (Mr. R. S. Scott, C.E.) an honorarium of 100*l.*, in recognition of the special services rendered by him while acting as engineer for a Bill which passed through Parliament last session, empowering the Local Board to construct a new promenade pier, roads, and other town improvements.

A Miniature Memorandum Book.—Messrs. Crosby Lockwood & Co. send us a memorandum-book of practical details, tables, and calculated results for mechanics, engineers, architects, builders, and surveyors, which contains a great deal of information compressed into a book which will literally go in the waistcoat pocket.

Architectural Partnership.—Mr. T. Chatfeild Clarke, F.R.I.B.A., whose name has been so long known in the profession, will take into partnership, from the 1st of January next, his son, Mr. Howard Chatfeild Clarke, and the style and title of the office from that date will be T. Chatfeild Clarke & Son.

Birmingham.—It is announced that it is the intention of Mr. Follett Osler, F.R.S., to present a new clock and bell to be fixed in the clock-tower of the new art-gallery in Birmingham, at a cost of about 1,000*l.* The new clock will have four dials, each some 12 ft. diameter.

The Municipal Records of Bath, from Richard I. to Elizabeth, are being prepared for publication under the editorship of Mr. Austin J. King and Benjamin V. Watts. The work will be published shortly by Mr. Elliot Stock.

Manchester Association of Employers and Foremen.—The annual general meeting of the members of the above Association was held on Saturday at the Mechanics' Institute, Manchester, Mr. Thomas Ashbury, C.E., the President, in the chair. There was a good attendance, and eight new members were elected. The retiring president, in reviewing the period during which he had occupied the chair, stated that the Association had made remarkable progress during the past two years, the number of members having increased forty-two per cent. The members admitted during the past two or three years were connected with firms employing no fewer than 50,000 skilled workmen, and the Association had now in hand accumulated savings amounting to 2,600*l.* Mr. Ashbury further added that Mr. William Mather had proposed to bring before the members the subject of technical education with the view of having this question thoroughly discussed by the members. On the motion of Mr. John Horsley, the retiring vice-president, seconded by Mr. Rawlinson, Mr. Alderman W. H. Bailey (W. H. Bailey & Co., Salford) was unanimously elected President for the ensuing year. Mr. Bailey, in thanking the members, said the society was composed of the most important firms in the engineering trades of Lancashire, and there was probably no similar association in the kingdom whose members employed more energy in connexion with steam engines. It was also one of the most important technical societies in the kingdom, and its papers had for years been conferring on the members what might be considered high-class technical education.

Thames Valley Drainage.—The Local Government Board inquiry before Mr. J. Thornhill Harrison, C.E., as to the proposed dissolution of the Lower Thames Valley Main Sewerage Board, or the separating from it of some of the constituent authorities, was continued at Kingston-on-Thames on Saturday. It was now stated on behalf of the Richmond Rural Sanitary Authority that that body did not desire the dissolution of the Joint Board or separation from it; and, further, that they were opposed to the proposed union of the urban and rural authorities in the matter of an independent scheme of sewage disposal for the five parishes comprised within the Richmond Poor Law Union. Mr. Michael, Q.C., the representative of the Ecclesiastical Commissioners, then addressed the Inspector in opposition to the various applications of authorities seeking separation from the Joint Board, whose action he defended. He severely criticised the decision of the Select Committee of the House of Commons upon the occasion of the Board's recent application for a provisional order to carry out the Mortlake scheme of Messrs. Mansergh and Melliss. He opposed the scheme of Messrs. Gotto & Beesley for bringing the sewage of Richmond district to Barnes upon land belonging to the Ecclesiastical Commissioners, and called evidence in condemnation of the proposal. A number of witnesses were examined in opposition to the Richmond case.

The Royal Exchange Assurance Company's Offices in Pall Mall.—Adjoining the Junior Carlton Club, in Pall Mall, the Royal Exchange Assurance Company are erecting new offices. The buildings have two frontages, one in Pall Mall and the other in St. James's-square. The Pall Mall frontage is 70 ft. in height, the elevation being faced with Mansfield stone, richly carved. The ground story, which will contain the principal business offices of the company, is upwards of 20 ft. in height. This portion of the elevation contains several full-length sculptured figures, the models for which were furnished by Mr. Boehm. There are three main upper floors, having two-light mullioned windows, between which are elaborately-carved columns and shafts with similar columns at each side of the frontage. The St. James's-square elevation, in its general character, resembles that in Pall Mall. Mr. G. Aitchison, of Harley-street, is the architect, and Mr. Woodward, of Wilson-street, Finsbury, is the contractor.

The Timber Supplies of Great Britain.—Mr. P. L. Simmonds read a paper on "Present and Prospective Sources of the Timber Supplies of Great Britain" at the meeting of the Society of Arts on Wednesday evening. We may return to the subject.

Moulded Bricks.—Messrs. Barber send us their illustrated catalogue of brick sections for mouldings, made by them at Mead Lodge Brick Works.

The Tooting Springs and the Southwark and Vauxhall Water Company.—A few weeks ago we referred to the deep well which the Southwark and Vauxhall Water Company are sinking at Streatham, which it was alleged was causing serious injury to the inhabitants of Tooting by draining upwards of one hundred private springs and wells, from which the residents in Tooting are largely supplied. At a public meeting of the inhabitants a committee was appointed to take the matter into consideration, and this committee presented its report at an adjourned meeting held in the vestry-hall, at Tooting, on Monday night, when it transpired that the opinion of the Solicitor-General had been taken on the question, and that it was adverse to the inhabitants. The Solicitor-General observes :—

"The case is undoubtedly a very hard one, but I am unable to see my way to suggest any legal remedy as open to the inhabitants of Tooting or the owners of the wells. At common law there is no right as to percolating water, and any person may pump on his own land, and collect and carry away the percolating water, even though by so doing he should dry his neighbours' wells. I think the Act of water companies which empowers them on their lands to sink wells and erect pumps certainly does not diminish their common law right, or entitle those who may be injured by the exercise of them to compensation. If the attention of the Legislature had been called to the matter they might, not improbably, have inserted some provision for the protection of the adjoining well-owners, as the water companies are, of course, likely to do far more than individuals would be to the prejudice of neighbouring well-owners. I fear that all that is open to the inhabitants is either an appeal to the Legislature, or by sinking deeper wells, and adding pumping apparatus, to compete with the water company for water. I am fully conscious how little either of these courses is likely to do for them, and I regret that I can suggest nothing better."

In answer to a further question, the Solicitor-General says he thinks that if the water company may legally pump the water they may legally sell it.

Large Sale of Building Land at Lewisham.—On Monday evening, Mr. Richard J. Collier, of Finsbury-pavement, conducted an extensive sale of building sites at Lewisham. The property consisted of the first portion of the Priory Estate, containing about 18 acres, with frontages to the Lewisham High-road and several new roads which have been laid out on the estate. The sale was held at the Plough Hotel, where there was a very large attendance of capitalists and others connected with the building trade. The number of lots advertised was fifty-one, the whole of them being sold, and, in consequence of a request by the company present that a further portion of the estate should be offered, the auctioneer consented to submit thirty-two additional lots, all of which were sold. One lot, having a frontage to Lewisham High-road of 23 ft., with a depth of 130 ft., was sold for 205*l.*; the smaller lots, having frontages of 20 ft. and a depth of 100 ft., realised prices averging from 65*l.* to 70*l.* each. One of the stipulations is that the minimum value of the houses to be erected on the estate is 300*l.*, whilst those having frontages to the high road are not to be of less value than 400*l.* Since the sale we understand that twenty-four more lots have been sold by private treaty bringing the total proceeds of the sale up to 6,500*l.*

Royal Meteorological Society.—At the usual monthly meeting of this Society, held on Wednesday evening last at the Institution of Civil Engineers, Mr. R. H. Scott, F.R.S., president, in the chair, Mr. Charles Harding read a paper on "The Diversity of Scales for Registering the Force of Wind." The object of this paper was to call attention to the confusion that exists in the systems in use by various countries for registering wind force, whether instrumentally or otherwise, and to show the need of action for improvement.

Middlesex Hospital.—In the account of the new works here which appeared in our last number (p. 807), it should have been mentioned that Messrs. Strode & Co., of Osnaburgh-street, did the whole of the gasfitting. In the same building the engineering work in connexion with the fire hydrants and system of fire extinguishing has been done by Messrs. Merryweather & Sons.

Fire-Resisting Doors.—The Council of the Society of Arts have awarded to Messrs. Chubb & Son the Gold Medal offered by the Society, under the Fothergill Trust, for the best exhibit in Class 27 of the International Health Exhibition. The exhibit referred to consisted of Chubb's patent fire-resisting doors.

The New-street Station Extension, Birmingham.—The works here are fast approaching completion, and in celebration of the event a dinner was held on Saturday evening, the 6th inst., at the Old Ring of Bells Tavern, Yardley, at which the various officials and sub-contractors were present, representing Messrs. Nelson & Co. The London and North-Western Railway Company, Messrs. Horton & Son (ironwork contractors), Messrs. Lander & Co. (timber work), Messrs. Braithwaite & Co. (glazing), and representative of various other trades.

Mr. R. J. Crocker, builder, of Bristol, died after an attack of paralysis at his residence, Southville, Bedminster, on the 12th inst. The deceased was a member of the Town Council for the East Ward, Bedminster, and was also a member of the Sanitary Committee of Bristol, and vice-chairman of the Bedminster Board of Guardians. The funeral took place on Tuesday, at Arno's Vale Cemetery, in the presence of a numerous company of prominent citizens. The esteem in which Mr. Crocker was held by his workmen was shown by their attendance at the funeral in large numbers.

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom required.	Premium.	Designs to be delivered.	Page.
Additions to Vestry Hall Buildings	Chelsea Vestry	100 guineas, first; 50 ,, second; 30 ,, third	Feb. 23rd	i.
Street Improvements	Croydon Corporation	100*l.*, 50*l.*, 25*l.*	March 25th	ii.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Sewerage Works	Tottenham Local Board	Mr. De Pape	Dec. 23rd	ii.
Erection of Laundry Buildings, Isleworth	Brentford Union	E. Monson, Junior	Dec. 30th	xviii.
Erection of New Sanitary Turret, &c.	Guardians of St. Luke, Chelsea			
Construction of two Bridges, Lenton	Midland Railway Co.	A. & C. Harston	Dec. 31st	xviii.
Supply and Erection of Ironwork for Bridges	do.	A. A. Langley	Jan. 2nd	ii.
Erection of New Picture Galleries, Nat. Gallry	Commissionrs of Works	do.	do.	ii.
Alterations to Derby County Court Offices	do.	*Official*	do.	ii.
Construction of Road, Lee-on-the-Solent	J. C. Robinson	do.	Jan. 5th	ii.
Engines and Boilers	Farnham Local Board	.....	do.	ii.
New Service Reservoir, Filter Beds, &c.	Bedford U. S. A.	J. Lemon	do.	ii.
Unclimbable Iron Fencing and Gates	Willesden Burial Board	J. Lund	Jan. 6th	ii.
Repairing Floor of the Pipe Chambers of Laundry	Commissnrs of Baths, &c.	.....	do.	xviii.
Sewerage, &c., Knighton	St. James, Westmstr	H. Monson	Jan. 7th	xviii.
Re-seating and Improvement, and Enlargement of Holy Trinity Church, Sheerness	Blaby R. S. A.	E. L. Miles	Jan. 9th	xviii.
Additions & Alterations to existing Buildings, and Fitting-up of necessary Machinery	Committee	R. Wheeler	do.	xviii.
Erection of Board School, Herne Bay	Commissionrs of Public Baths, &c., Brmndsy	G. Elkington & Son	do.	ii.
Enlargement, and part Re-building Church of St. Mark, Bexhill, near Hastings	Herne School Board	.....	Jan. 13th	ii.
Guernsey, &c., Granite	Rev. J. N. Simpson	Riches & Esam	Jan. 15th	ii.
Pulling down of four Houses, and Purchase of Old Materials	Finchley Local Board	G. W. Brumel	Jan. 19th	ii.
	St. James's Property Company	.....	Not stated	xviii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Chief Accountant	Sheffield Un. Gas Lght C.	Not stated	Dec. 27th	xvi.
Civil Engineer or Surveyor	Billesden U. R. S. A.	Not stated	Jan. 2nd	xvi.
Surveyor and Inspector of Nuisances	Cheshunt Local Board	175*l.*	Jan. 5th	xvi.

TENDERS.

For new Metropolitan Free Hospital, Kingsland-road. Messrs. H. H. Collins & James Edmeston, joint architects. Quantities supplied by Messrs. Hovenden, Heath, & Berridge :—

		Addition for Oak Flooring.
J. R. Hunt	£23,300 0 0	£640 0 0
Williams & Son	23,200 0 0	530 0 0
J. Woodward	23,067 0 0	929 0 0
Colls & Son	23,050 0 0	1,576 0 0
W. Shepperd	22,975 0 0	909 0 0
Higgs & Hill	22,940 0 0	1,200 0 0
T. Boyce	22,510 0 0	1,550 0 0
Kirk & Randall	22,420 0 0	470 0 0
Conder	22,363 0 0	1,512 0 0
Ashby & Horner	22,270 0 0	1,088 0 0
Perry & Co.	22,236 0 0	850 0 0
W. Brass	21,877 0 0	1,100 0 0
Mark Gentry	21,500 0 0	350 0 0
J. Morter	21,327 0 0	705 0 0
J. Smith & Son	21,111 0 0	599 0 0
E. Lawrence & Son	21,019 0 0	1,050 0 0
Mowlem & Co.	20,890 0 0	1,389 0 0
W. & F. Croaker	20,860 0 0	660 0 0
W. Downs	20,835 0 0	550 0 0
W. Shurmur	20,574 0 0	540 0 0

For draining, making walks, building boundary walls, and fixing palisading, iron fencing, and gates, for the Wimbury Burial Board, Middlesex :—

Rowley	£1,047 0 0
Cohen	1,044 8 0
Castle	1,031 0 0
Killingback	1,025 0 0
Burnham	965 0 0
Shephard	880 0 0
Belham	850 0 0
Holliday	821 0 0
Cardus	798 0 0
Batchelor	790 0 0
Haynes	779 16 4
Pinfold	770 10 0
Pizzey	765 0 0
Priestley	719 0 0
Wood	705 0 0

For pulling down and rebuilding the Sir Sydney Smith, Chester-street, Kennington-road, for Mr. Caley. Mr. Geo. Treacher, architect, 23, Carter-lane, City :—

Hammond	£2,450 0 0
Canning & Mullins	2,347 0 0
Burnham & Son	2,245 0 0
Smith	2,157 0 0
Jackson & Todd	2,040 0 0
J. Beale	1,998 0 0

For York-buildings Board School, for the Southampton School Board. Mr. E. J. Howell, architect :—

Chapman	£2,489 0 0
Dyer & Son	2,484 0 0
Bailey	2,448 0 0
Stevens & Sons	2,398 0 0
Rowland & Sons	2,349 0 0
Sanders	2,340 0 0
J. Bull, Sons, & Co. (Limited)	2,300 0 0
J. Crook (accepted)	2,270 0 0

For lodge, coach-house, and stabling, at Highfield, Fordingbridge, for the Executors of the late Mr. J. R. Neave. Mr. Fred Bath, architect. Quantities supplied :—

	Net.
George Dolman, Salisbury	£1,495 0 0
John Shering, Fordingbridge	1,471 0 0
F. J. Meader, Wimborne	1,459 10 3
Edward Smith, Wimborne	1,454 12 0
John Wort, Salisbury	1,431 0 0
Philip Tryhorn, Salisbury	1,392 6 0
Charles Mitchell, Downton	1,319 2 0
Gilbert Harris, Salisbury	1,241 0 0
E. Young & Sons, Salisbury*	1,230 0 0

* Accepted, subject to modifications.

For the erection of the Museum and Schools of Science and Art, Chester. Mr. Thomas M. Lockwood, architect, 80, Foregate-street, Chester. Quantities supplied :—

	Terra-cotta Dressings.	Stone Dressings.
Forrester & Mayers, Chester	£9,350	£9,300
William Vernon, Chester	9,270	9,390
Wm. Andrews, Chester	9,100	9,175
Thomas Tyson, Liverpool	9,035	9,255
Bull, Sons, & Co., Southampton	9,000	9,213
William Parrott, Chester	8,965	8,769
Thomas Browne, Chester	8,890	9,040
Thomas Hughes, Chester	8,850	9,120
Brown & Backhouse, Liverpool	8,824	8,924
James Hamilton, Altrincham	8,750	8,850
Thomas Munnerley, Bebington	8,603	9,021
John Gallimore, Newcastle	8,595	8,840
John Matthews, Nantwich	8,500	8,700
Samuel Warburton, Manchester	8,400	8,500
Edmund Gabbutt, Liverpool*	7,956	8,151

[Architect's estimate (terra-cotta), 8,500*l.*]

* Accepted.

For the construction of new street and the drainage of building land, Cope-street, Coventry. Mr. Herbert W. Chattaway, surveyor, Trinity Churchyard, Coventry :—

G. F. Smith, Milverton	£399 0 0
C. Haywood, jun., Coventry	395 0 0
W. Boon (accepted)	383 0 0

For making two new roads, laying sewers and drains, constructing flushing tank, concrete retaining walls, &c, on the Grove House Estate, Windsor, for Messrs. Bolton & Co., Temple. Mr. T. P. H. Davison, engineer:—

Botterill, Cannon-street	£1,262	0	0
Bishop, Windsor	1,200	0	0
Akery, Windsor	1,098	0	0
Knapp, Windsor	1,052	0	0
Hann & Co., Windsor	1,028	0	0
Streeter, Croydon	1,004	0	0
Pizzey, Hornsey	999	0	0
Nicholls, Wood-green	997	0	0
Bottoms Bros., Battersea	992	0	0
T. Adams, Moorgate street	979	0	0
Pound, Bow	975	0	0
Cooke & Co., Battersea	957	0	0
Kelly, Windsor	949	0	0
Smart, Nottingham and Finsbury	948	10	0
Rowland Bros., Fenny Stratford	947	0	0
Bampfylde, Windsor	924	0	0
Reavell, Windsor	878	0	0
Oliver, Brockley	850	0	0
Willis, Windsor	846	0	0
Hare, Clapham	799	0	0
Free & Sons, High Wycombe	796	12	9
Trueman, South Hackney	795	0	0
Hill, High Wycombe	783	17	3
Etheridge, Croydon (accepted)	739	0	0

Accepted for new shop-front fittings and decorations at 115, Westbourne-grove, for Madame Julia. Designed by Mr. Reuben Brooks:—

G. S. Archer, Featherstone-street	£265	10	0

[No competition.]

For new bar, front, &c., to the New Inn, Shefford, Beds, for Mr. Wells. Messrs. Usher & Anthony, surveyors:—

L. Stapleton, Hitchin	£150	0	0
W. Daniels, Clophill	131	10	0
W. Wootton, Shefford	94	0	0
J. P. White, Bedford (accepted)	92	0	0
R. Ransom, Arlsey	70	0	0

For extension of main sewer at Barmouth, to Hanlith-terrace. Mr. Thomas Roberts, engineer, Assoc. M. Inst. C.E.:—

John Jones, Barmouth	£240	2	0
W. Davies, Portmadoc	200	10	0
S. P. Owen, Portmadoc (accepted)	150	0	0

[Engineer's estimate, 200*l*.]

For the restoration of the tower of Frodsham Parish Church Messrs. Linaker & Davies, architects, Frodsham. Quantities by the architects:—

E. Aukland, Warrington	£2,500	0	0
Stelfox & Carter, Northwich	2,494	0	0
R. Beckett, Hartford	2,117	10	0
Johnson & Son, Kelsall	2,022	12	8
Thomas Davies, Frodsham*	2,000	0	0

* Accepted.

For the erection of shop, &c., for Mr. S. Smith, Luton. Mr. A. E. Smith, architect:—

	Elevation A.			Part in Mansfield stone.			Elevation B.		
Saunders	£1,691	10	0	£1,691	10	0	£1,651	10	0
Redhouse	1,578	0	0	1,618	0	0	1,586	0	0
Neville	1,489	0	0	1,504	0	0	1,499	0	0
Dunham	1,430	0	0	1,500	0	0	1,470	0	0

* Accepted.

For alterations to 22, Tottenham-court-road. Mr. Geo. Edwards, architect. Quantities by Mr. H. Lovegrove:—

Craske	£2,041	0	0
Nightingale	2,010	0	0
Martin, Wells, & Co.	1,980	0	0
Green	1,890	0	0
Axford	1,885	0	0
Patman & Fotheringham	1,800	0	0
Scharien & Williams	1,772	0	0
Stimpson & Co.	1,736	0	0
Scrivener & Co. (accepted)	1,707	0	0

For making a new road and laying down pipe sewer, and building retaining brick walls, at Pentonville-road, for Mr. A. Attneave:—

Mckenzie, City	£2,296	0	0
Neave & Son, Kilburn	1,705	0	0
Wilkinson, Finsbury Park	1,666	0	0
Pizzey, Hornsey	1,222	0	0
Killingback, Camden Town	1,135	0	0

Accepted for converting the old Police Station, Salisbury, into Club premises, for Mr William Marlow. Mr. Fred. Bath, architect, Salisbury and London:—

John Wort, Salisbury	£225	0	0

[No competition.]

Accepted for new shop-front for Messrs. Brown Bros., Paris:—

F. Sage & Co.	£140	0	0

Accepted for alterations to shop in Fenchurch-street, for Messrs. Crowther & Goodman:—

F. Sage & Co.	£190	0	0

Accepted for new office screens, for Messrs. Stapley & Smith, London-wall:—

F. Sage & Co.	£200	0	0

For the erection of two cottages at the Irrigation Farm, Bedford. Mr. Lund, architect and surveyor:—

G. Haynes	£419	10	0
Melcombe	415	3	4½
J. P. White	412	0	0
G. Harrison	389	0	0
Clayson & Co.	385	0	0
Corby & Son	375	0	0
Geo. Freshwater	374	5	0
C. Dennis	370	0	0
J. Smith	369	0	0
E. Pacey	365	10	0
J. Haynes	361	4	0
T. Laughton	357	0	0
G. Todd	344	0	0
J. Carter (accepted)	337	10	0

SPECIAL NOTICE.—Lists of Tenders for insertion in our next must reach us *not later than* 4 *p.m.* on TUESDAY NEXT, Dec. 23.

TO CORRESPONDENTS.

M. & L. (we will publish it in the course of two or three weeks).—Priory (719,787*l*.).—H. & K.—A. H.—H. A. (you are altogether at sea in your philology: there is no such word as "crucia"; the plural is "cruces").—J. H. (next week).

All statements of facts lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read a public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PUBLISHER'S NOTICES.

Christmas Week—*The* BUILDER *for the week ending December 27th will be published on* **Wednesday, 24th** *inst., at the usual hour.*

Advertisements for insertion in that issue must, therefore, reach the Office before Three o'clock P.M. *on* **Tuesday, 23rd** *inst.*

ALTERATIONS IN STANDING ADVERTISEMENTS, *or* ORDERS TO DISCONTINUE SAME, *cannot be attended to if received after* 12 (*noon*), *on* **Monday, 22nd.**

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Terms for Series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

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PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, Covent-garden, W.C. to

DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office*, 46, Catherine-street, Covent-garden, W.C. *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum, PREPAID. To countries within the Postal Union, 26s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher No. 46, Catherine-street, W.C

Best Bath Stone.
WESTWOOD GROUND,
Box Ground, Combe Down,
Corsham Down,
And Farleigh Down.
RANDELL, SAUNDERS, & CO., Limited,
Corsham, Wilts. [ADVT.

Dry Corsham Stone.
150,000 FEET CUBE.
PICTOR & SONS,
BOX, WILTS.
[ADVT.

Doulting Freestone.

THE CHELYNCH STONE. The stone from these quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable stones in England.

THE BRAMBLEDITCH STONE. Is of the same crystalline nature as the Chelynch Stone, but finer in texture, and more suitable for fine moulded work.

HAM HILL STONE.

Greater facilities have been provided for working these quarries, and the stone can be supplied in large quantities at short notice.

Prices, and every information given, on application to CHARLES TRASK & SONS, Norton-sub-Hamdon, near Ilminster, Somerset.
London Agent — Mr. E. WILLIAMS,
16, Craven-street, Strand, W.C. [ADVT.

Doulting Free Stone
HAM HILL STONE,
BLUE LIAS LIME
(Ground or Lump),
For prices, &c., address S. & J. STAPLE, Quarry Owners, Stone and Lime Merchants, Stoke-under-Ham, Ilminster. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT.

J. L. BACON & CO.,
MANUFACTURERS OF IMPROVED
STEAM AND HOT-WATER APPARATUS,
FOR WARMING AND VENTILATING
Private Houses, Churches, Schools, Hospitals, Manufactories, Greenhouses, &c.
OFFICES AND SHOW-ROOMS:—
No. 34, UPPER GLOUCESTER PLACE, DORSET SQUARE, LONDON, N.W.
And at DUBLIN, BELFAST, GLASGOW, and NEWCASTLE.
Illustrated Pamphlet on "Heating" post free.

BANNER VENTILATORS.

The Strongest Exhaust Ventilators for all Buildings, Public Halls, Churches, Billiard-Rooms, &c.

HIGHEST PRIZES at all the most important Exhibitions.

BANNER SYSTEM OF SANITATION AND SANITARY APPLIANCES
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